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Manuscript Report No. 88-15

Fish Population Data from Split and Stephens lakes, 1987

By Hagenson, I. 1988

Manitoba
Natural Resources
Fisheries

Errata Manuscript Report No. 86-04

Fish Population Data from Split and Stephens Lakes, 1984. By Kirton, J. A. W. 1986.

	Total CUE* (No./100yds/day)	Total CUE* (kg/100yds/day)
Table 6.	4.74 (28.40)	3.06 (18.34)
Table 7.	1.78 (10.67)	1.70 (10.19)
Table 8.	4.13 (24.78)	2.61 (15.65)
Table 9.	3.18 (19.11)	2.20 (13.19)
Table 10.	3.59 (21.56)	0.91 (5.48)
Table 11.	0.67 (4.0)	0.24 (1.47)
Table 12.	2.11 (12.67)	2.07 (12.44)
Table 13.	1.78 (10.67)	4.39 (26.34)

Numbers in parentheses are the incorrect values originally published.

Errata Manuscript Report No. 87-04

Fish Population Data from Rat and Split Lakes, 1985. By Hagenson, I., 1987.

	Total CUE* (No./100yds/day)	Total CUE* (kg/100yds/day)
Table 6.	19.28 (115.71)	16.06 (93.39)
Table 7.	7.39 (44.33)	5.53 (33.16)
Table 8.	12.52 (75.14)	8.17 (49.05)
Table 9.	6.56 (39.33)	4.37 (26.24)
Table 10.	7.28 (43.71)	14.35 (86.15)
Table 11.	1.28 (7.67)	1.93 (11.56)
Table 12.	3.86 (23.17)	0.88 (5.30)

Numbers in parentheses are the incorrect values originally published.

Errata Manuscript Report No. 87-26

Fish Population Data from Split and Stephens Lakes, 1986. By Hagenson, I., 1987.

	Total CUE* (No./100yds/day)	Total CUE* (kg/100yds/day)
Table 6.	9.38 (56.28)	8.61 (51.65)
Table 7.	5.01 (30.05)	5.98 (35.86)
Table 8.	3.19 (19.41)	1.74 (10.47)
Table 9.	2.36 (14.15)	1.36 (8.18)
Table 10.	5.14 (30.86)	0.92 (5.50)
Table 11.	1.79 (10.73)	0.59 (3.54)
Table 12.	1.38 (8.29)	1.75 (10.49)
Table 13.	1.01 (6.05)	1.74 (10.47)
Table 14.	1.67 (10.05)	0.27 (1.61)

Numbers in parentheses are the incorrect values originally published.

Hagenson, I. 1988.

Fish Population Data from Split and Stephens lakes, 1987.

Manitoba Department of Natural Resources.
Fisheries Branch MS Report No. 88-15.

ABSTRACT

The fish populations of Split and Stephens lakes were sampled in the summer of 1987. The collected data are summarized in this report, with special emphasis on the relative abundance of each species and the effects of various mesh sizes on fish species. Growth rates, age compositions, maturity, survival and mortality rates of whitefish (Coregonus clupeaformis), walleye (Stizostedion vitreum vitreum), sauger (Stizostedion canadense) and northern pike (Esox lucius) are also described, in order to provide a data base for future management purposes.

TABLE OF CONTENTS

	Page
ABSTRACT	i
LIST OF FIGURES	iii
LIST OF TABLES	v
INTRODUCTION	1
METHODS	2
RESULTS	3
ACKNOWLEDGEMENTS	5
REFERENCES	6
APPENDICES	66

LIST OF FIGURES

Figure		Page
1.	Map of Split Lake showing large scale area boundaries .	7
2.	Net set locations in area A, Split Lake, 1987	8
3.	Net set locations in area B, Split Lake, 1987	9
4.	Net set locations in area C, Split Lake, 1987	10
5.	Map of Stephens Lake showing large scale area boundaries	11
6.	Net set locations in area A, Stephens Lake, 1987	12
7.	Net set locations in area B, Stephens Lake, 1987	13
8.	Net set locations in area C, Stephens Lake, 1987	14
9.	Age composition of whitefish from Split and Stephens lakes, 1987	15
10.	Age composition of walleye from Split and Stephens lakes, 1987	16
11.	Age composition of sauger from Split and Stephens lakes, 1987	17
12.	Age composition of northern pike from Split and Stephens lakes, 1987	18
13.	Length - frequency distribution for whitefish from Split and Stephens lakes, 1987	19
14.	Length - frequency distribution for walleye from Split and Stephens lakes, 1987	20

Figure Page

15. Length - frequency distribution for sauger from Split and Stephens lakes, 1987 21

16. Length - frequency distribution for northern pike from Split and Stephens lakes, 1987 22

17. Length - frequency distribution for cisco from Split and Stephens lakes, 1987 23

18. Length - frequency distribution for white suckers from Split and Stephens lakes, 1987 24

19. Length - frequency distribution for longnose suckers from Split and Stephens lakes, 1987 25

20. Length - frequency distribution for mooneye from Split and Stephens lakes, 1987 26

21. Length - frequency distribution for yellow perch from Split and Stephens lakes, 1987 27

22. Length - frequency distribution for burbot from Split and Stephens lakes, 1987 28

23. von Bertalanffy and power regression curves for whitefish from Split and Stephens lakes, 1987 29

24. von Bertalanffy and power regression curves for walleye from Split and Stephens lakes, 1987 30

25. von Bertalanffy and power regression curves for sauger from Split and Stephens lakes, 1987 31

26. von Bertalanffy and power regression curves for northern pike from Split and Stephens lakes, 1987 32

LIST OF TABLES

Table		Page
1.	Catch summary for experimental fishing sets in Split Lake, 1987	33
2.	Catch summary for experimental fishing sets in Stephens Lake, 1987	34
3.	Catches per unit of effort by number and weight and percent frequency of occurrence for fish species in Split and Stephens lakes, 1987	35
4.	Mesh size effects on the number and total weight (kg) of fish caught in 31 experimental net sets in Split Lake 1987	36
5.	Mesh size effects on the number and total weight (kg) of fish caught in 37 experimental net sets in Stephens Lake, 1987	37
6.	Mesh size effects on whitefish catches in Split Lake 1987	38
7.	Mesh size effects on whitefish catches in Stephens Lake, 1987	39
8.	Mesh size effects on walleye catches in Split Lake 1987	40
9.	Mesh size effects on walleye catches in Stephens Lake, 1987	41

Table Page

10. Mesh size effects on sauger catches in Split Lake, 1987 42
11. Mesh size effects on sauger catches in Stephens Lake, 1987 43
12. Mesh size effects on northern pike catches in Split Lake, 1987 44
13. Mesh size effects on northern pike catches in Stephens Lake, 1987 45
14. Mesh size effects on white sucker, longnose sucker and shorthead redhorse sucker catches from Split Lake, 1987 46
15. Mesh size effects on white sucker, longnose sucker and shorthead redhorse sucker catches from Stephens Lake, 1987 47
16. Mesh size effects on cisco, mooneye and goldeye catches from Split Lake, 1987 48
17. Mesh size effects on cisco, mooneye and goldeye catches from Stephens Lake, 1987 49
18. Mesh size effects on burbot, yellow perch, lake chub and freshwater drum catches from Split Lake, 1987 50
19. Mesh size effects on burbot, yellow perch, lake chub and freshwater drum catches from Stephens Lake, 1987 .. 51
20. Age-specific size and maturity conditions for whitefish from Split Lake, 1987 52

Table Page

21. Age-specific size and maturity conditions for whitefish from Stephens Lake, 1987 53

22. Age-specific size and maturity conditions for walleye from Split Lake, 1987 54

23. Age-specific size and maturity conditions for walleye from Stephens Lake, 1987 55

24. Age-specific size and maturity conditions for sauger from Split Lake, 1987 56

25. Age-specific size and maturity conditions for sauger from Stephens Lake, 1987 57

26. Age-specific size and maturity conditions for northern pike from Split Lake, 1987 58

27. Age-specific size and maturity conditions for northern pike from Stephens Lake, 1987 59

28. Length-weight curves for fish captured in Split and Stephens lakes, 1987 60

29. Maturity rate equations of whitefish, walleye, sauger and northern pike from Split and Stephens lakes, 1987 61

30. Mortality and survival rates for whitefish, walleye, sauger and northern pike from Split and Stephens lakes, 1987 62

31. Walford curves for whitefish, walleye, sauger and northern pike from Split and Stephens lake, 1987 63

Table Page

32. Relationships of log $(L_\infty - l_t)$ and t (years) for whitefish, walleye, sauger and northern pike from Split and Stephens lakes, 1987 64

33. Power curves for whitefish, walleye, sauger and northern pike from Split and Stephens lakes, 1987 65

INTRODUCTION

The data presented in this report were collected in the summer of 1987 as part of the Ecological Monitoring Project. The purpose of the Ecological Monitoring Project is to ascertain and to evaluate current impacts and long term effects of existing and planned hydroelectric developments in northern Manitoba on abiotic and biotic environments in affected lakes and watercourses. The specific purpose is to address concerns expressed under Claim #18 of the Northern Flood Agreement. This report is of a preliminary nature, confined only to the description of fish populations in Split and Stephens lakes.

The main objectives of this report are:

1) to list the fish species caught, along with their relative abundance and cathes per unit of effort,
2) to compare the effects of various mesh sizes on the number and total weight of each species caught and,
3) to describe age-composition, length-frequency distributions, maturity, growth and mortality regimes of whitefish, walleye, sauger and northern pike.

The function of this report is to provide baseline data on the fish populations of these lakes, therefore interpretation and discussion of the results is not included.

METHODS

Experimental Netting

All lakes were fished with a standard gang of gillnets. Each gang was composed of six gillnets with the following mesh sizes: 3.8 cm (1.5 in.), 5.1 cm (2 in.), 7.6 cm (3 in.), 9.5 cm (3.75 in.), 10.8 cm (4.25 in.) and 12.7 cm (5 im). Each net in the gang was 22.9 m (25 yd.) long and 1.8 m (5 ft.) deep. Gillnets were set overnight for a 16 - 20 h duration.

Fork length and round weight were recorded for all fish caught. Sex and state of maturity were recorded for the principal commercial species, whitefish, walleye, sauger and northern pike. For age determination otoliths were taken from whitefish, walleye and sauger. Cleithra were taken from northern pike. Otoliths were prepared and aged according to procedures described by Erickson (1979). Cleithra were cleaned of flesh and aged using an illuminated magnifying glass.

Claculations

Routine statistical analyses were performed according to Snedecor and Cochran (1967). Maturity, mortality and growth analyses were performed as described by Hagenson (1987). The presentation format of some figures and tables may have changed slightly.

RESULTS

Standard gang netting locations in Split and Stephens lakes are identified in Figs 2-4 and 6-8. The catches of all species in each standard gang are enumerated in Tables 1 and 2. Average catches per standard gang and the relative abundance of each species are compared in Table 3. The number and total weight of each species caught in nets of different mesh sizes are listed in Tables 4 and 5.

Further analyses are performed for whitefish, walleye, sauger, and northern pike. These analyses include:

1) the effects of different mesh sizes on the catch per unit of effort, mean length, mean weight, percentage of mature fish, mean age and age-% frequency (Tables 6-19),
2) age-specific size and maturity conditions for males, females and both sexes combined (Tables 20-27),
3) length-weight regressions (Table 28),
4) age-% frequency distribution for both sexes combined (Figs. 9-12), and length-frequency distributions (Figs. 13-22).
5) maturity regimes for males, females and both sexes combined (Table 29), and mortality-survival rates for both sexes combined (Table 30), and

6) derivation of von Bertalanffy's growth curves for both sexes combined (Table 31 and 32 and Figs. 23-26).

7) power curve length-age relationship (Table 33 and Figs. 23-26).

ACKNOWLEDGEMENTS

The field data were collected by I. Hagenson, M. Patterson and B. Cherepak. Jeanette Forte typed the manuscript.

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Snedecor, G. W. and W. G. Cochran. 1967. Statistical Methods. 6th ed. Iowa State Univ. Press, Ames, Iowa. 593pp.

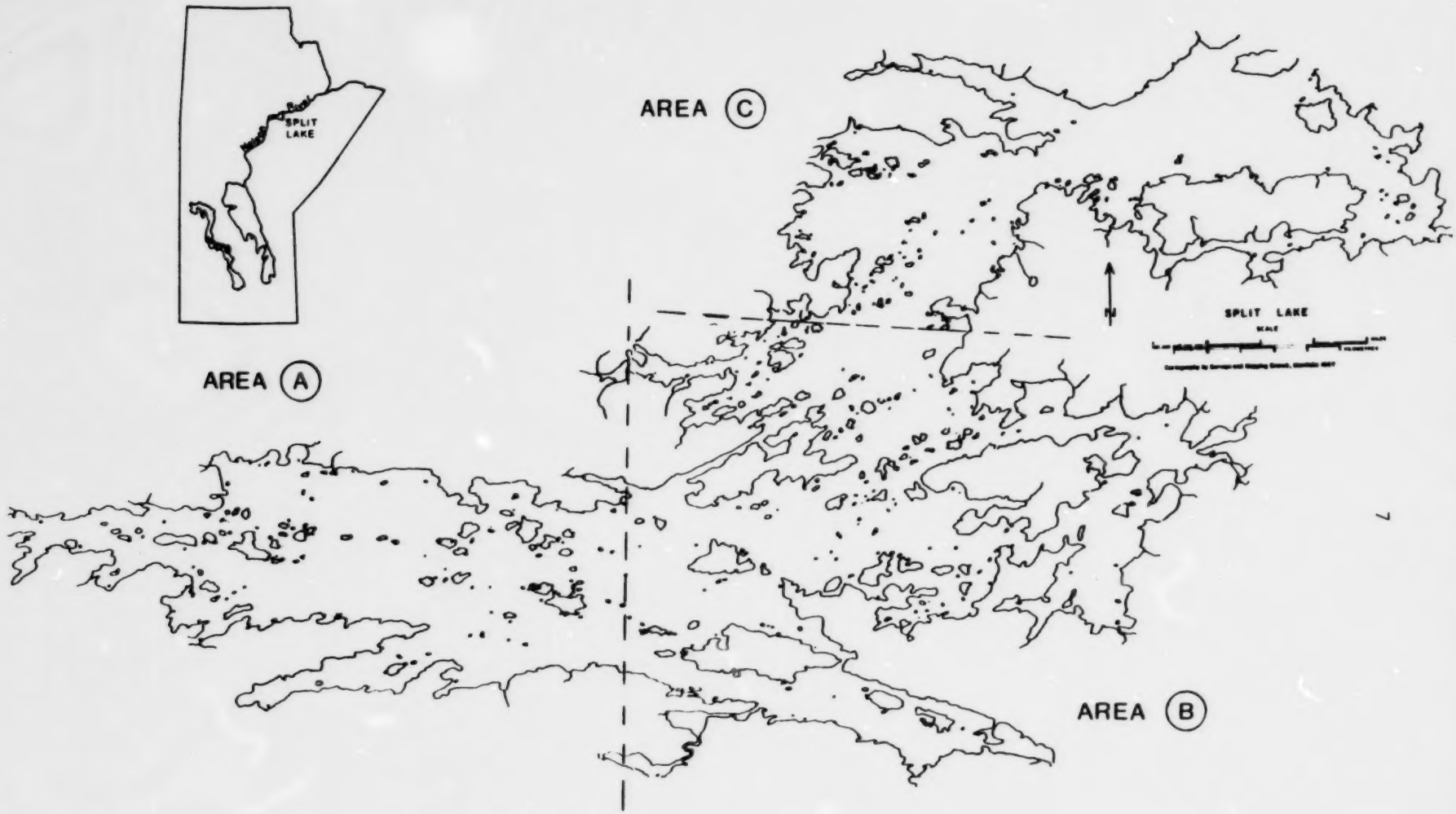

Fig. 1. Map of Split Lake showing large scale area boundaries.

Fig. 2. Net set locations in Area A, Split Lake, 1987.

Fig. 3. Net set locations in Area B, Split Lake, 1987.

Fig. 4. Area C, Split Lake, 1987. Note no net sets made in this area for 1987.

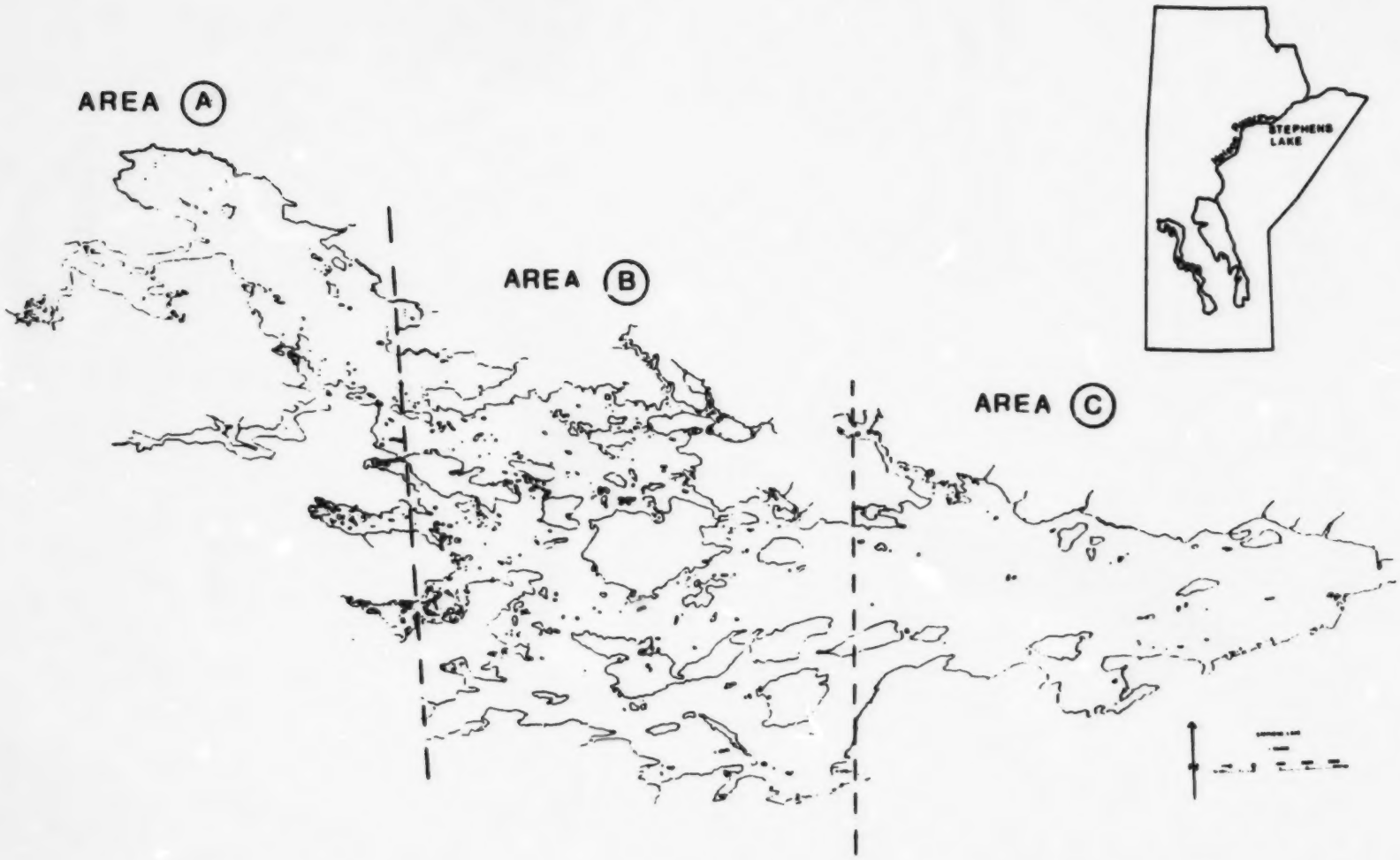

Fig. 5. Map of Stephens Lake showing large scale boundaries.

Fig. 6. Net set locations in Area A, Stephens Lake, 1987.

Fig. 7. Net set locations in Area B, Stephens Lake, 1987.

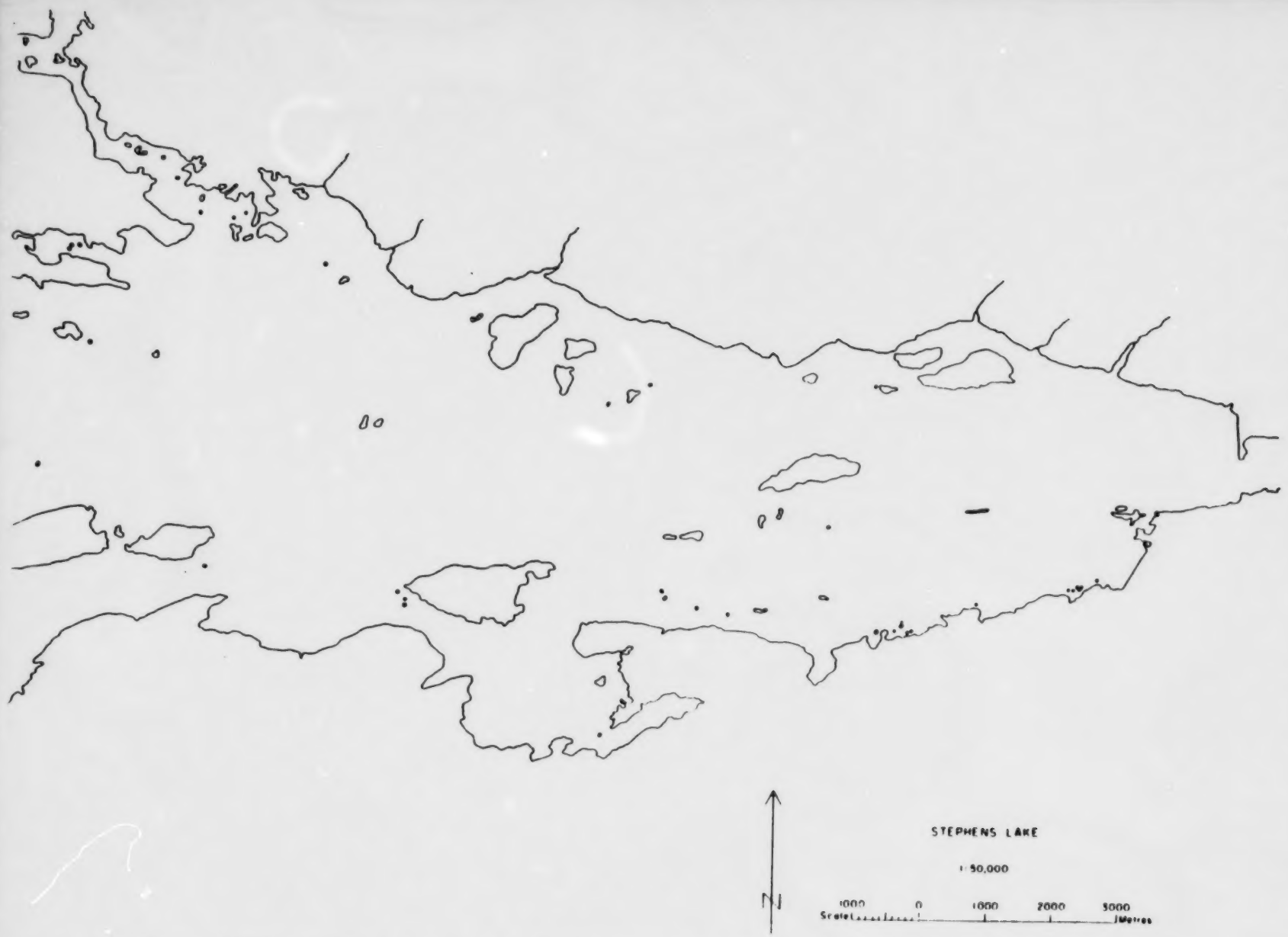

Fig. 8. Area C, Stephens Lake, 1987. Note no net sets were made in this area in 1987.

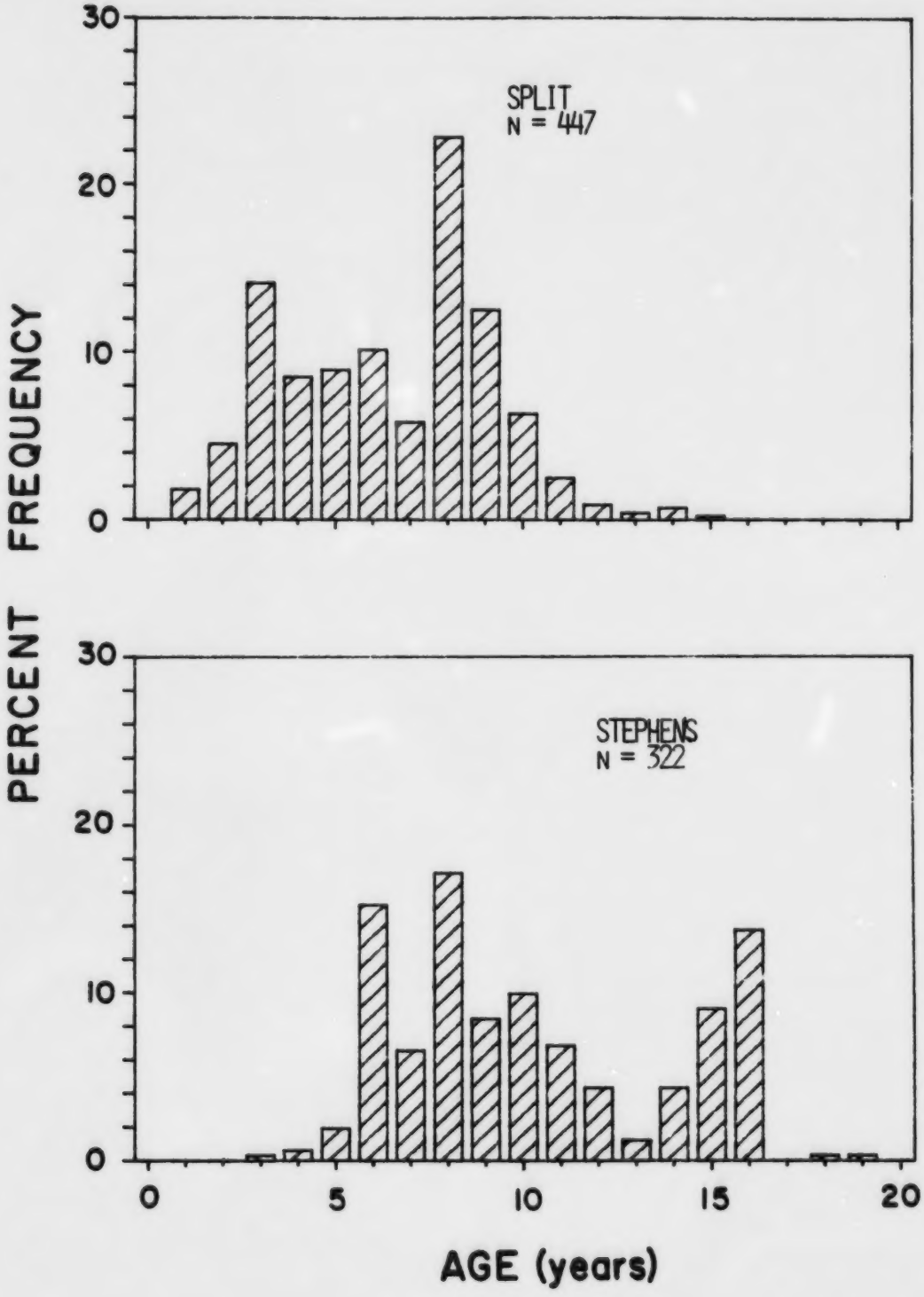

Fig. 9. Age composition of whitefish from Split and Stephens lakes, 1987.

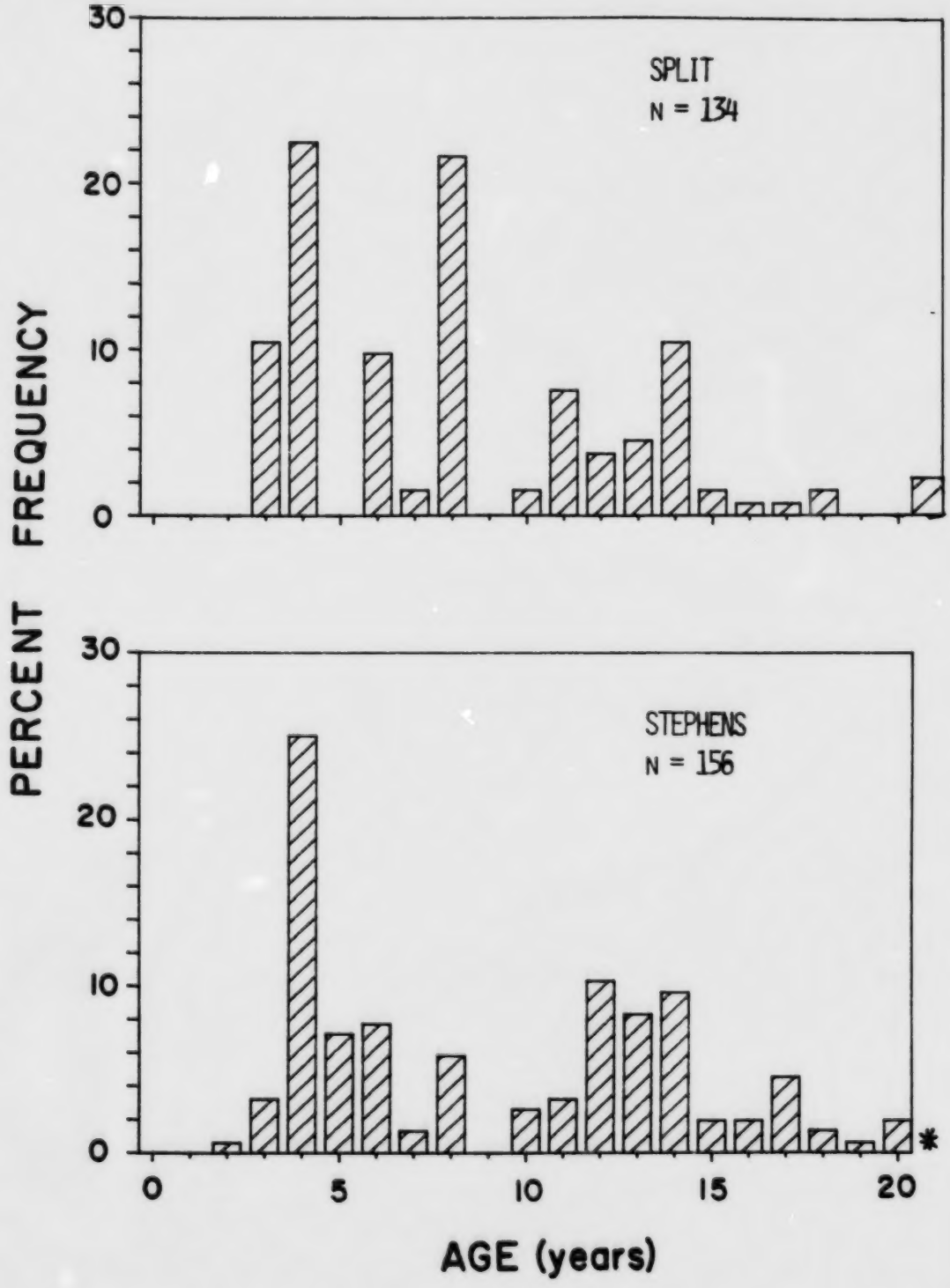

Fig. 10. Age composition of walleye from Split and Stephens lakes, 1987.

* age 21 = 1.3%
age 24 = 1.3%
age 25 = 0.6%

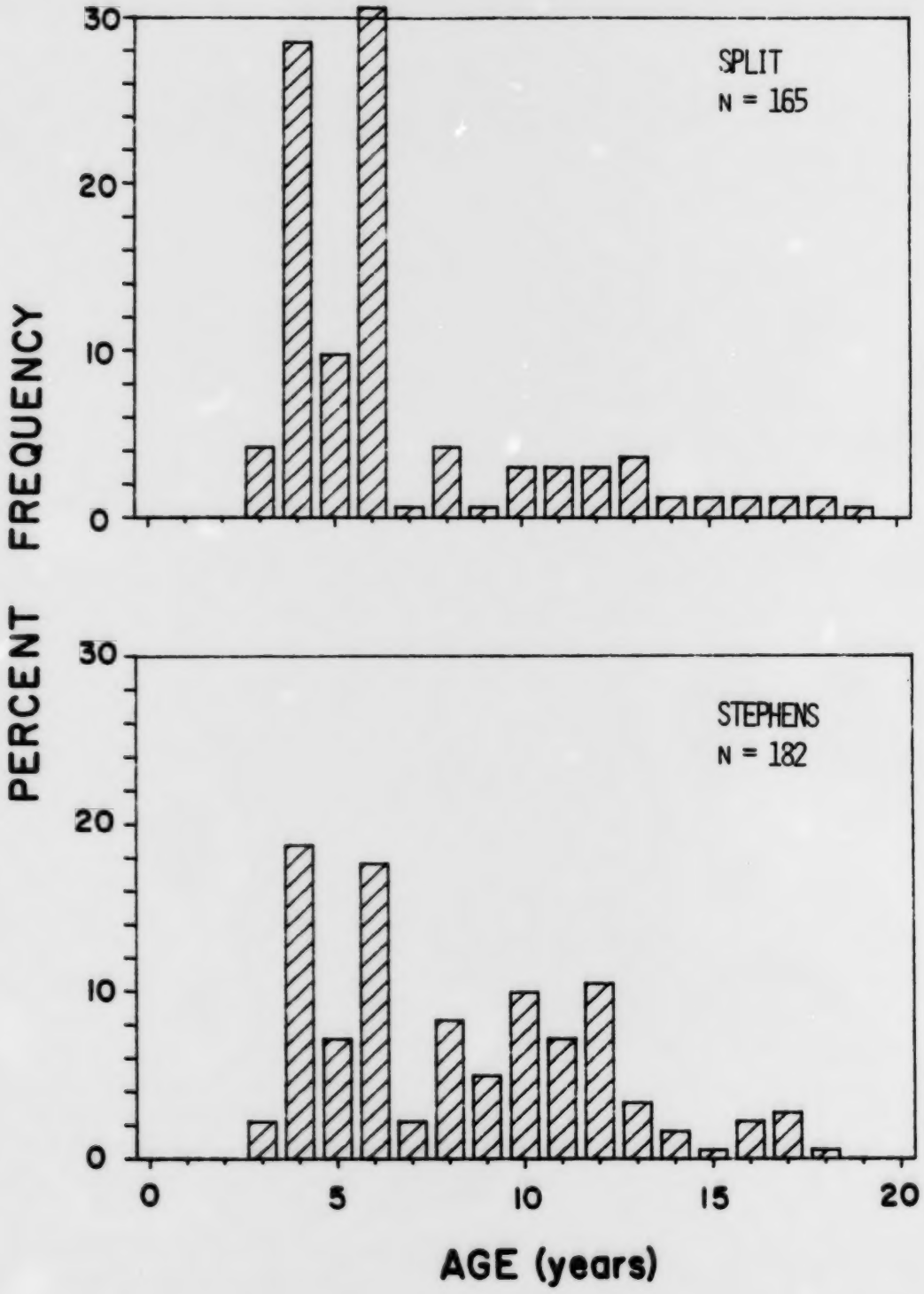

Fig. 11. Age composition of sauger from Split and Stephens lakes, 1987.

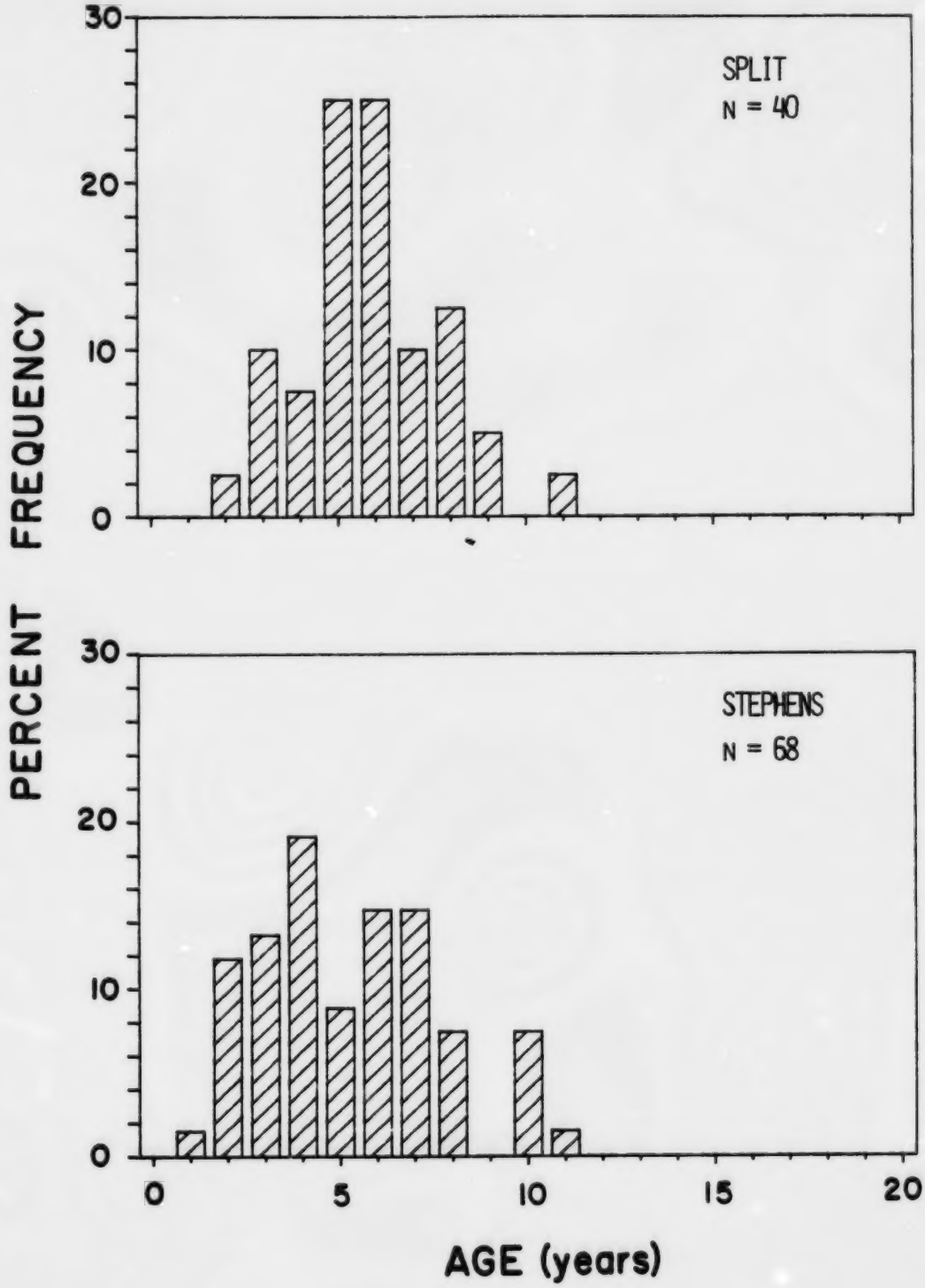

Fig. 12. Age composition of northern pike from Split and Stephens lakes, 1987.

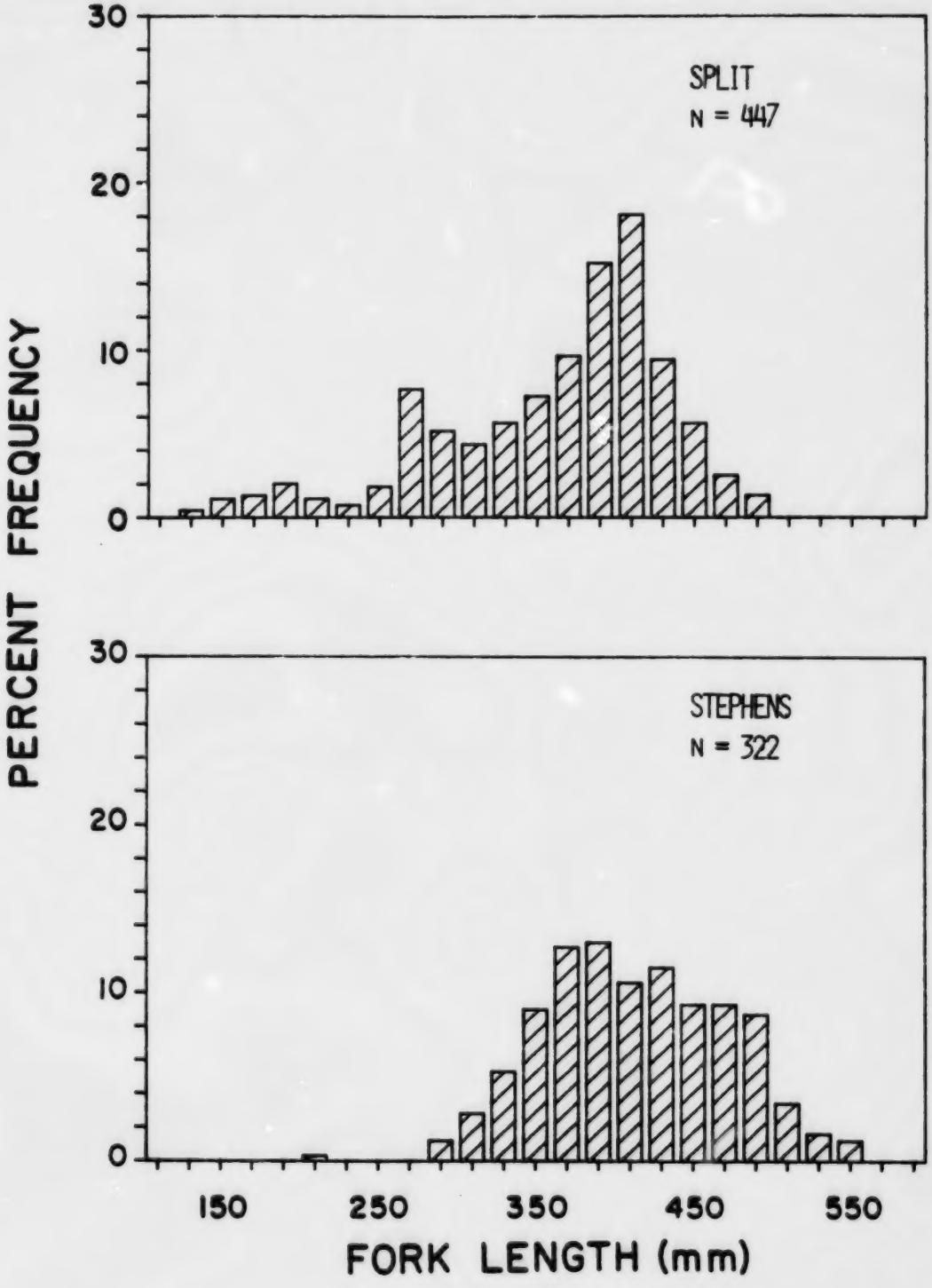

Fig. 13. Length frequency distribution for whitefish from Split and Stephens lakes, 1987.

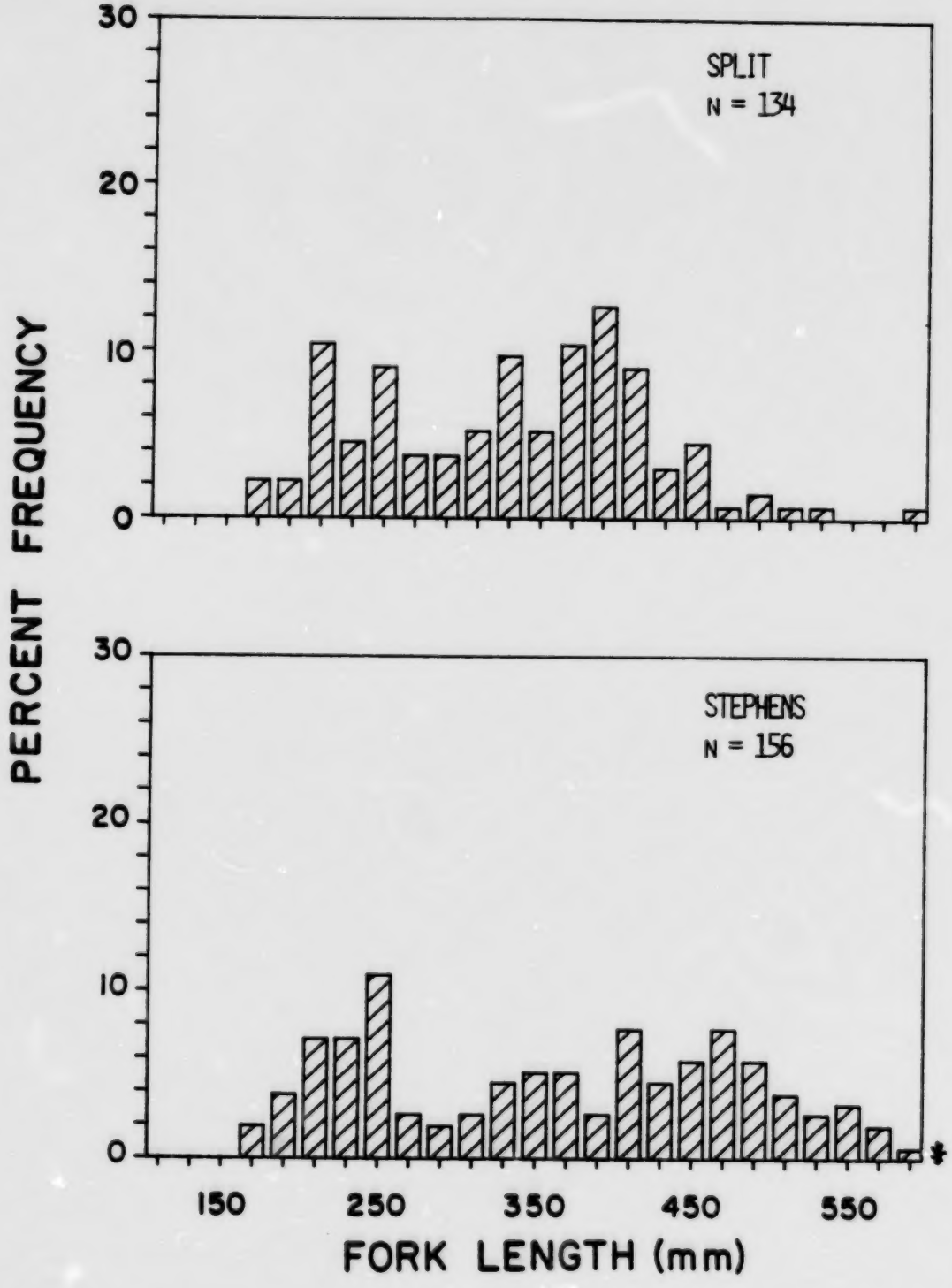

Fig. 14. Length - frequency distribution for walleye from Split and Stephens lakes, 1987.

* 610 = 0.6%
630 = 0.6%
same as 590

Fig. 15. Length - frequency distribution for sauger from Split and Stephens lakes, 1987.

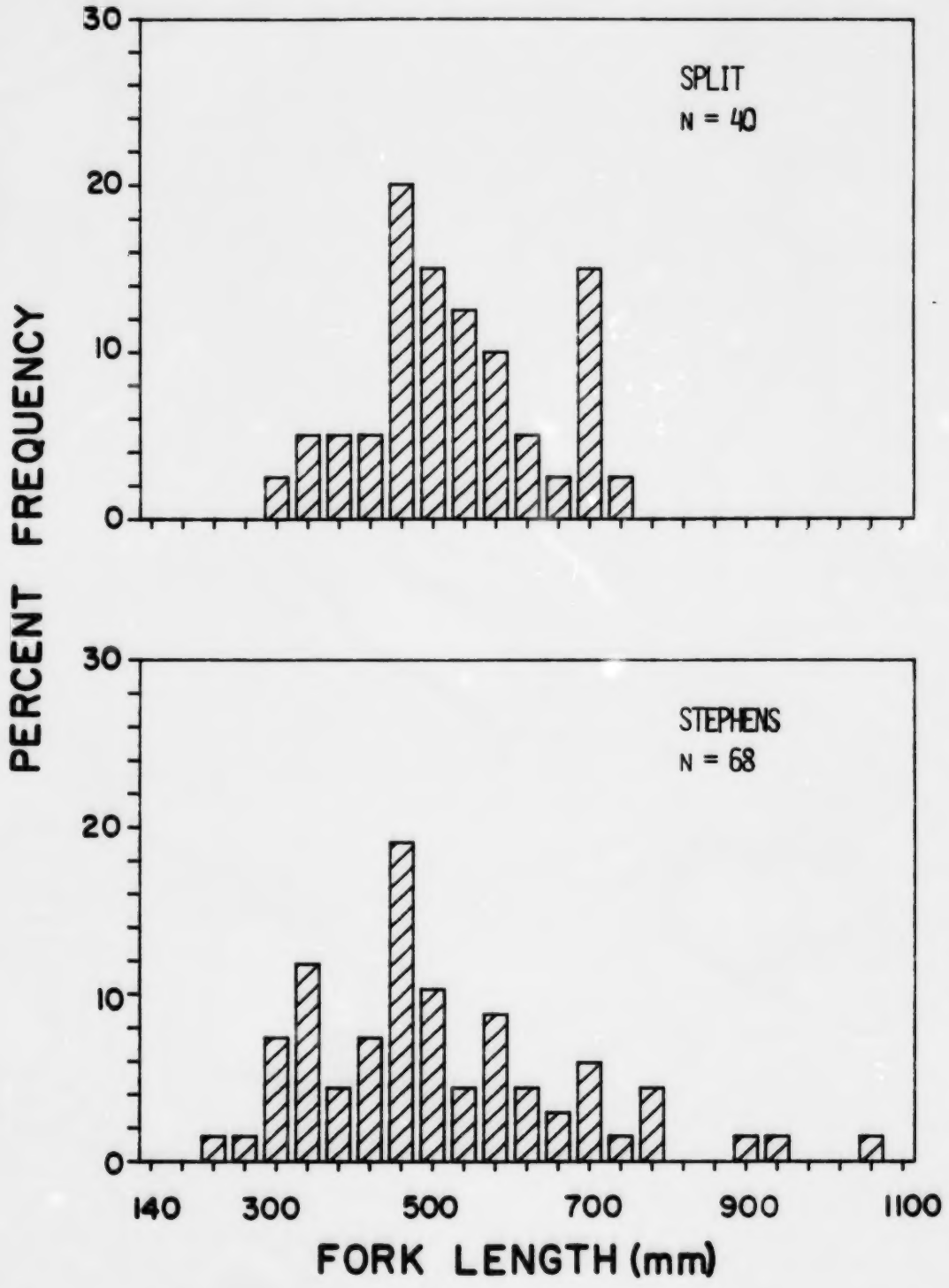

Fig. 16. Length - frequency distribution for northern pike from Split and Stephens lakes, 1987.

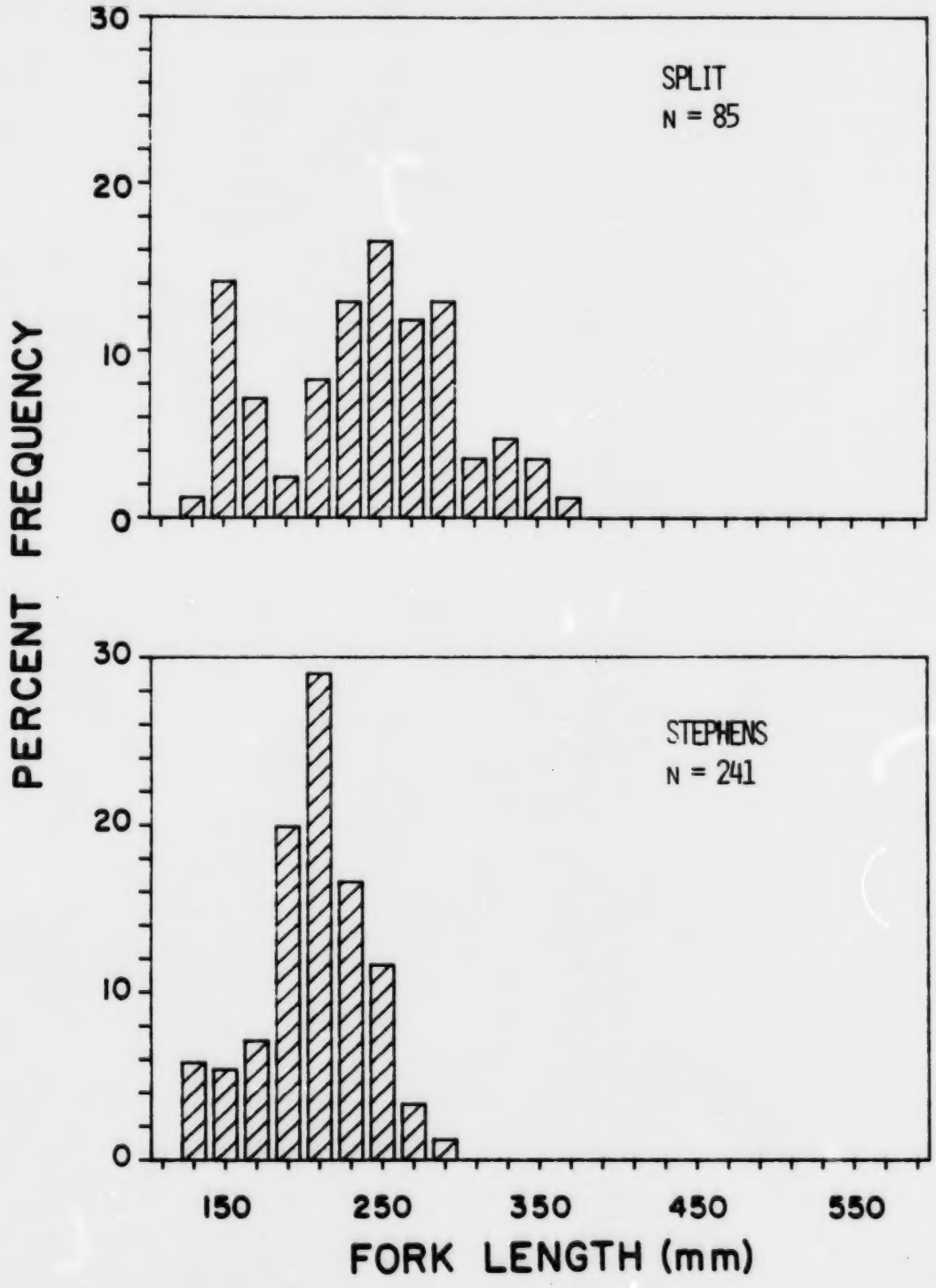

Fig. 17. Length - frequency distribution for cisco from Split and Stephens lakes, 1987.

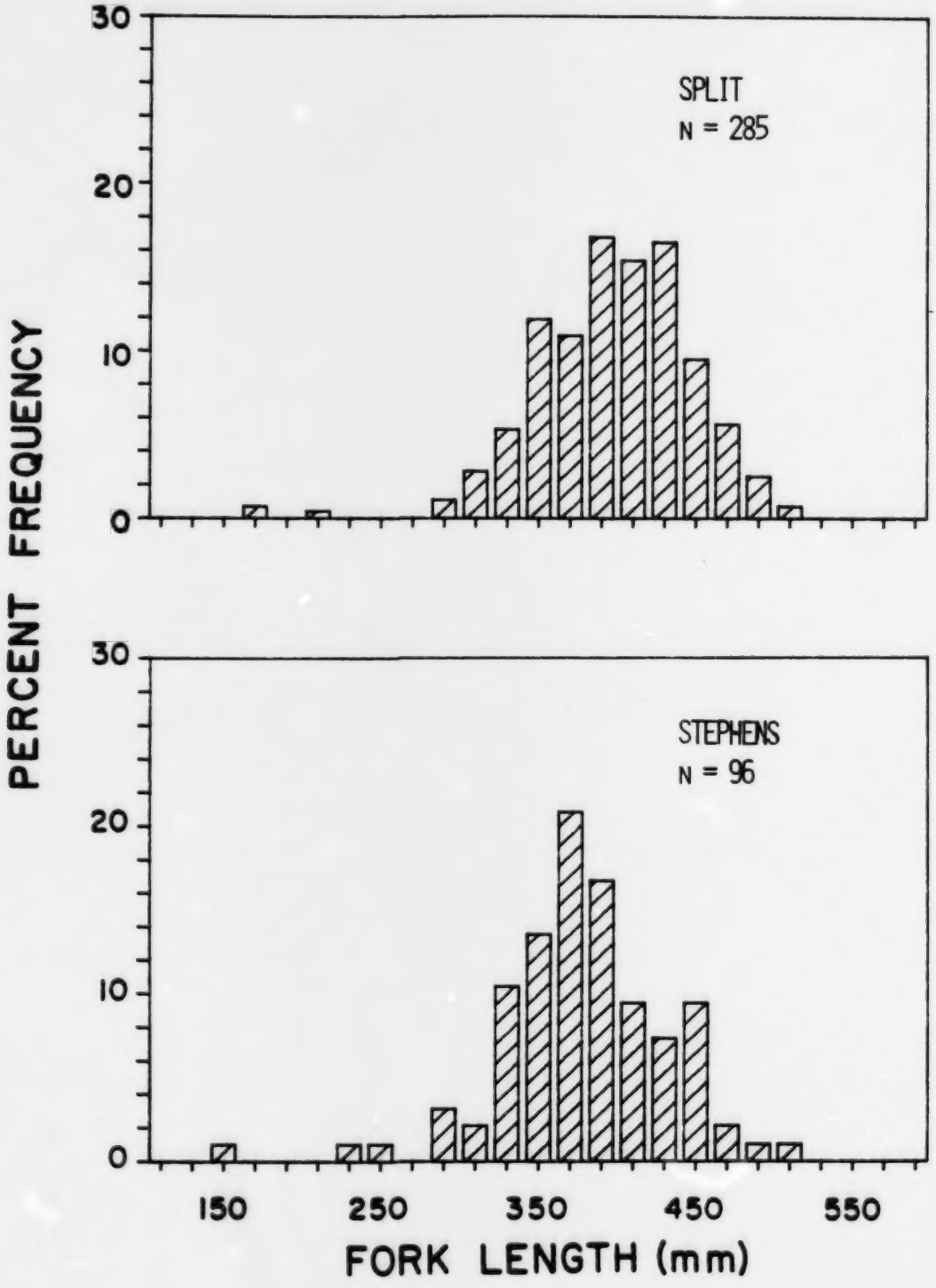

Fig. 18. Length - frequency distribution for white sucker from Split and Stephens lakes, 1987.

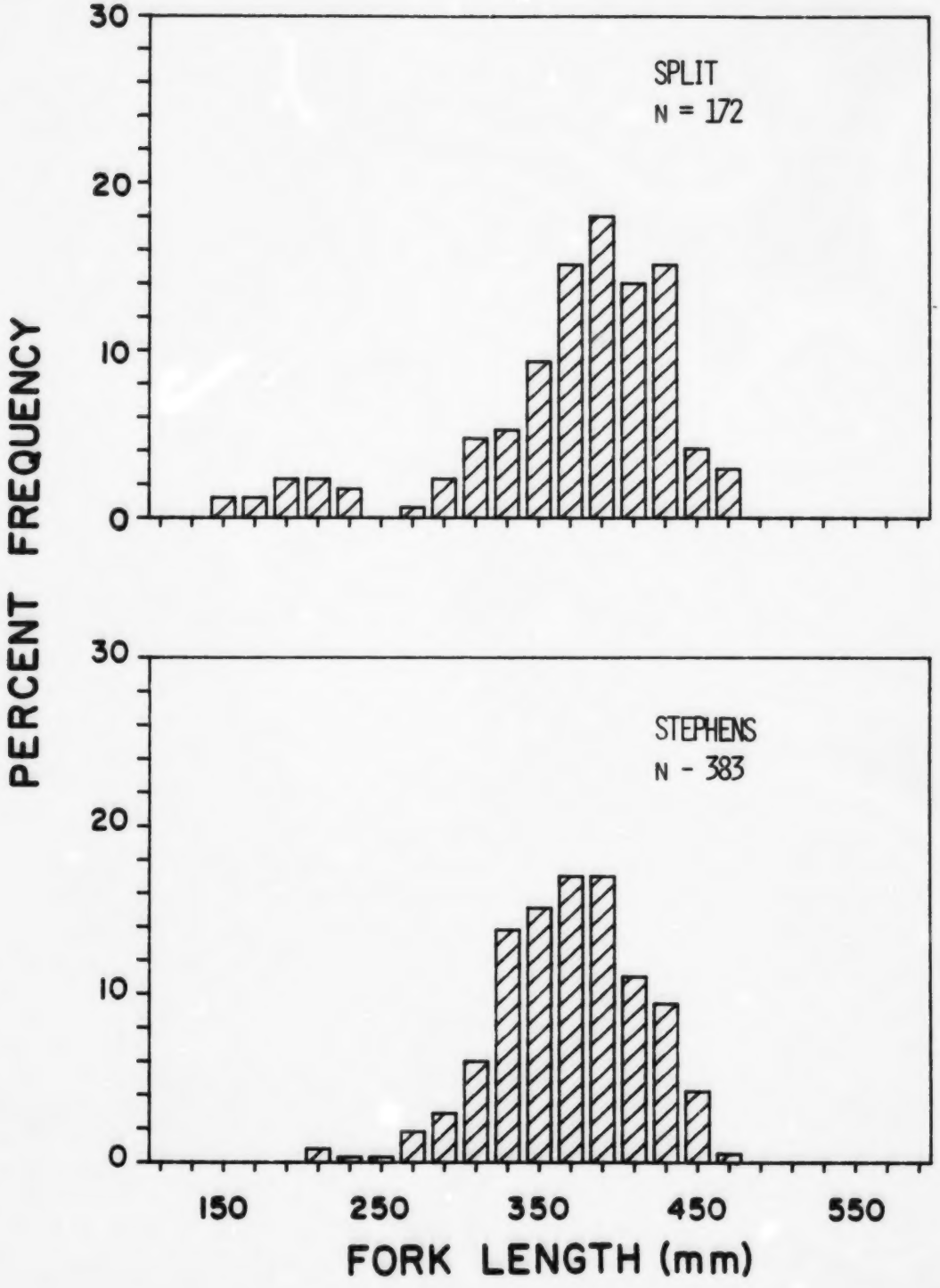

Fig. 19. Length - frequency distribution for longnose suckers from Split and Stephens lakes, 1987.

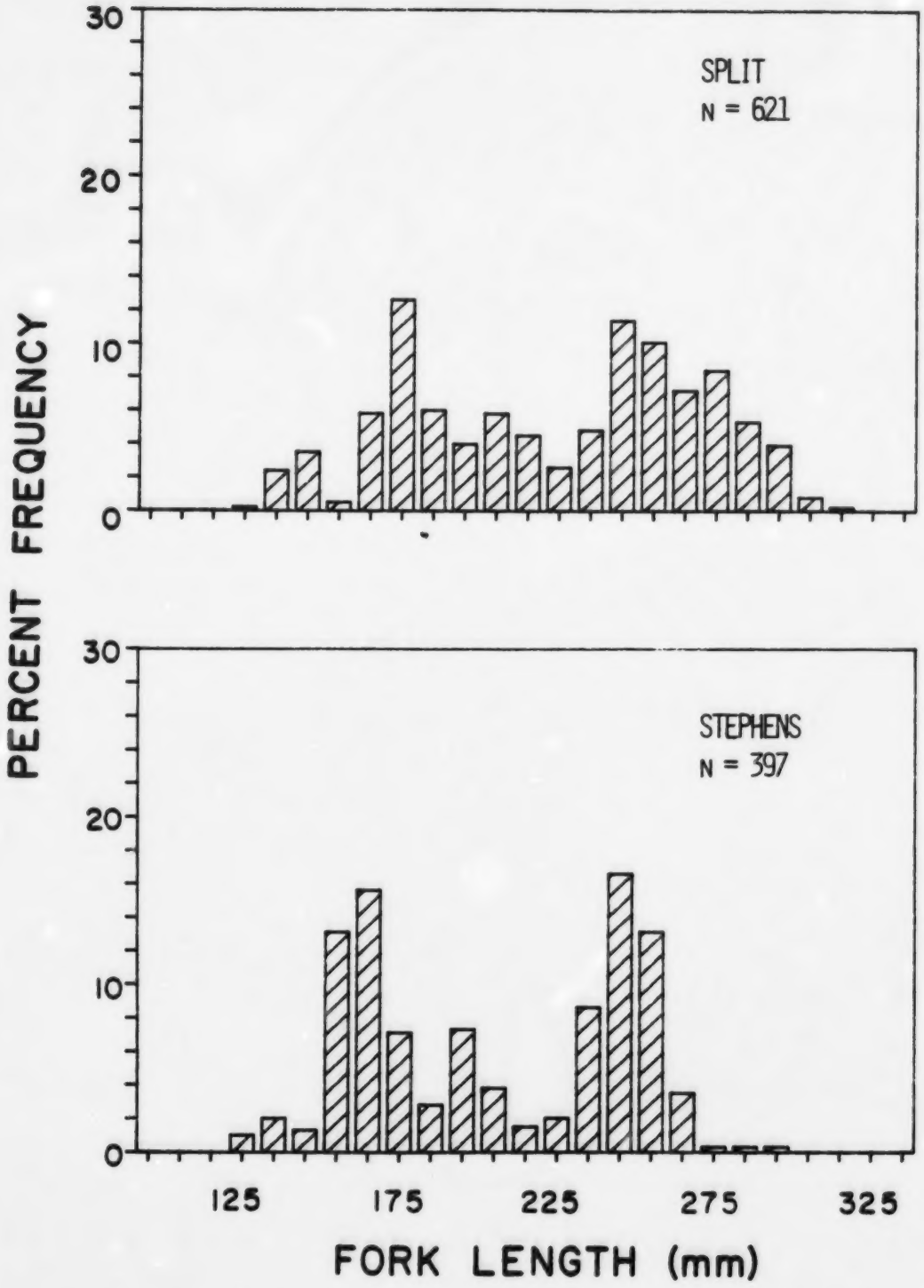

Fig. 20. Length -frequency distribution for mooneye from Split and Stephens lakes, 1987.

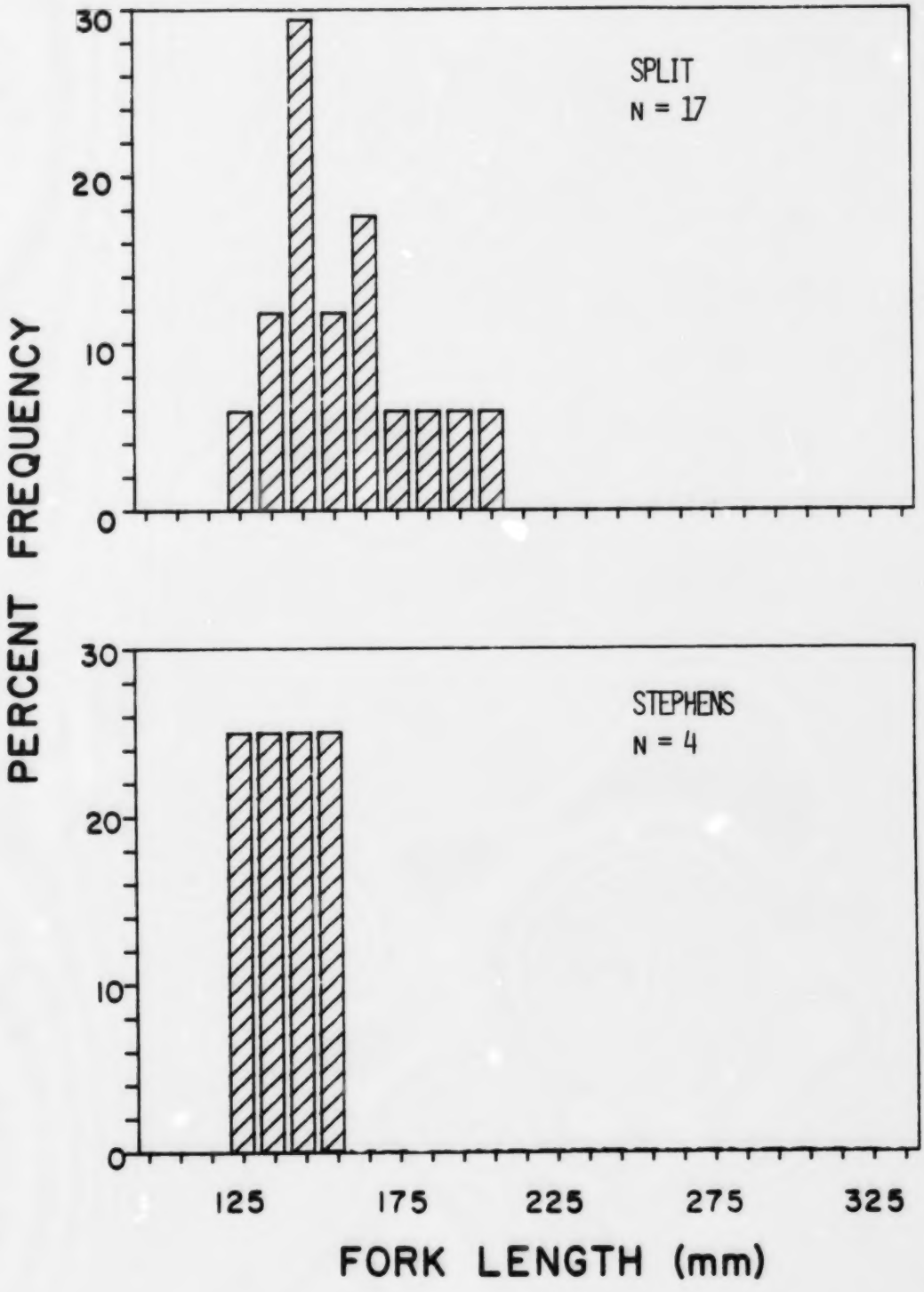

Fig. 21. Length - frequency distribution for yellow perch from Split and Stephens lakes, 1987.

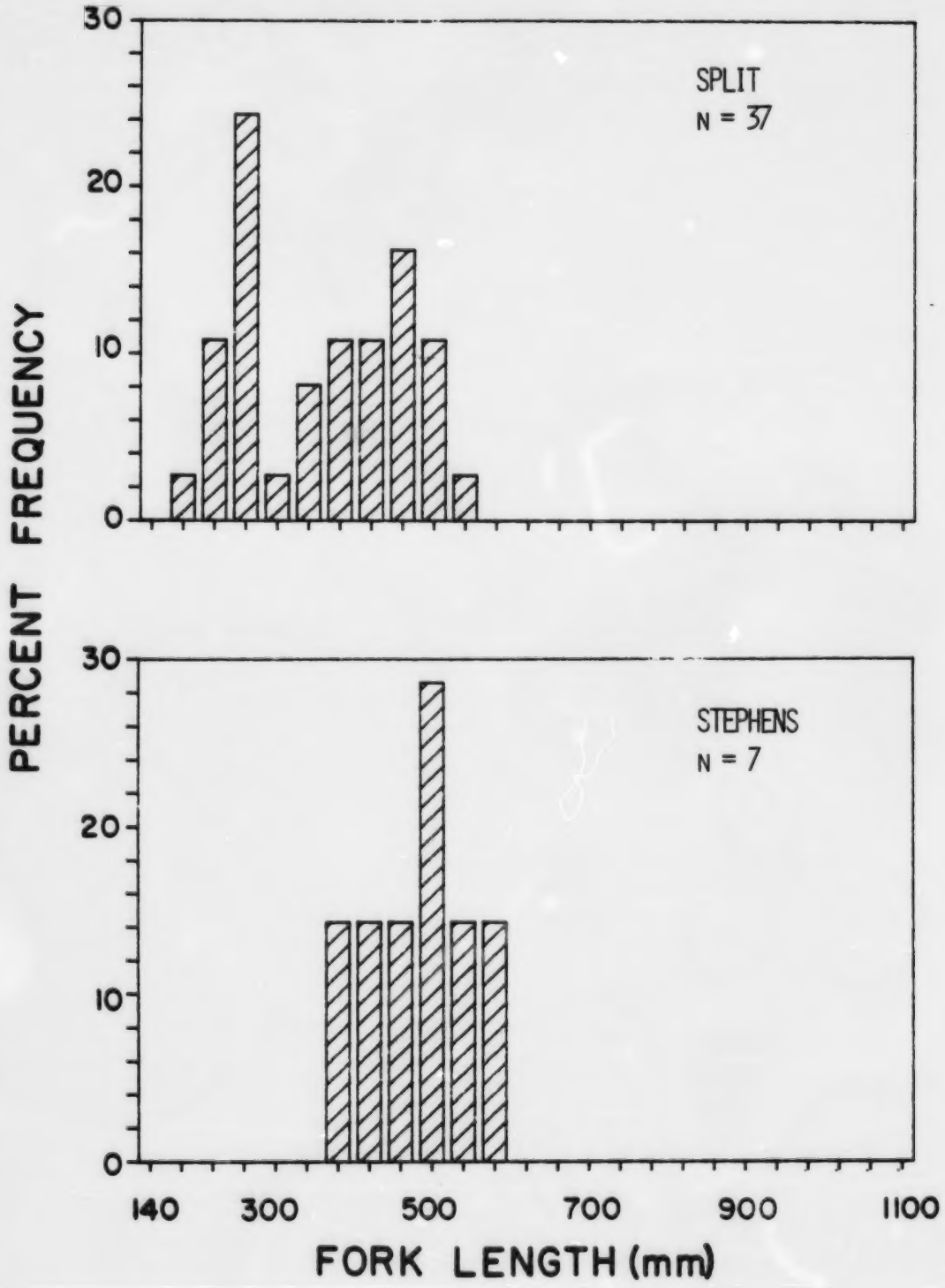

Fig. 22. Length - frequency distribution for burbot from Split and Stephens lakes, 1987.

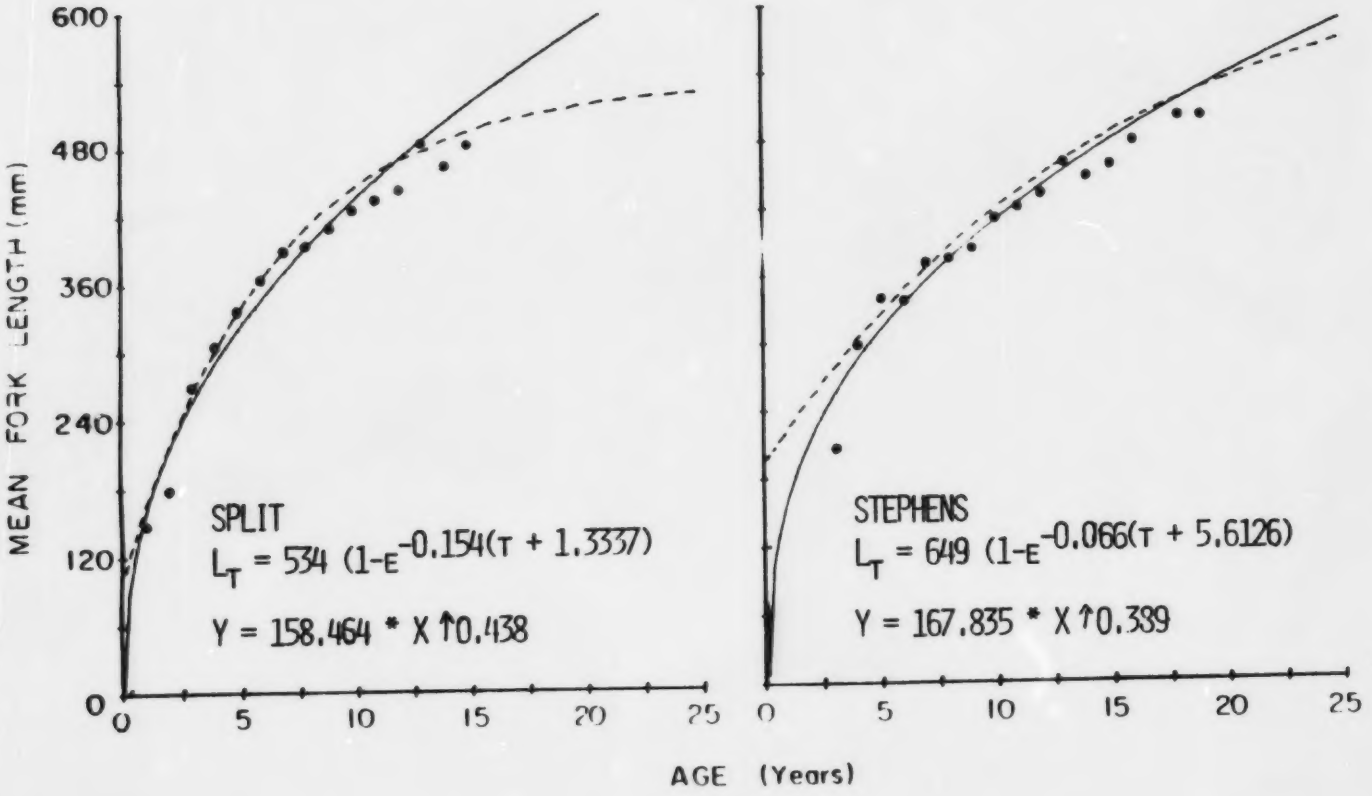

Fig. 23. Von Bertalanffy (---) and power (——) regression curves for whitefish from Split and Stephens lakes, 1987.

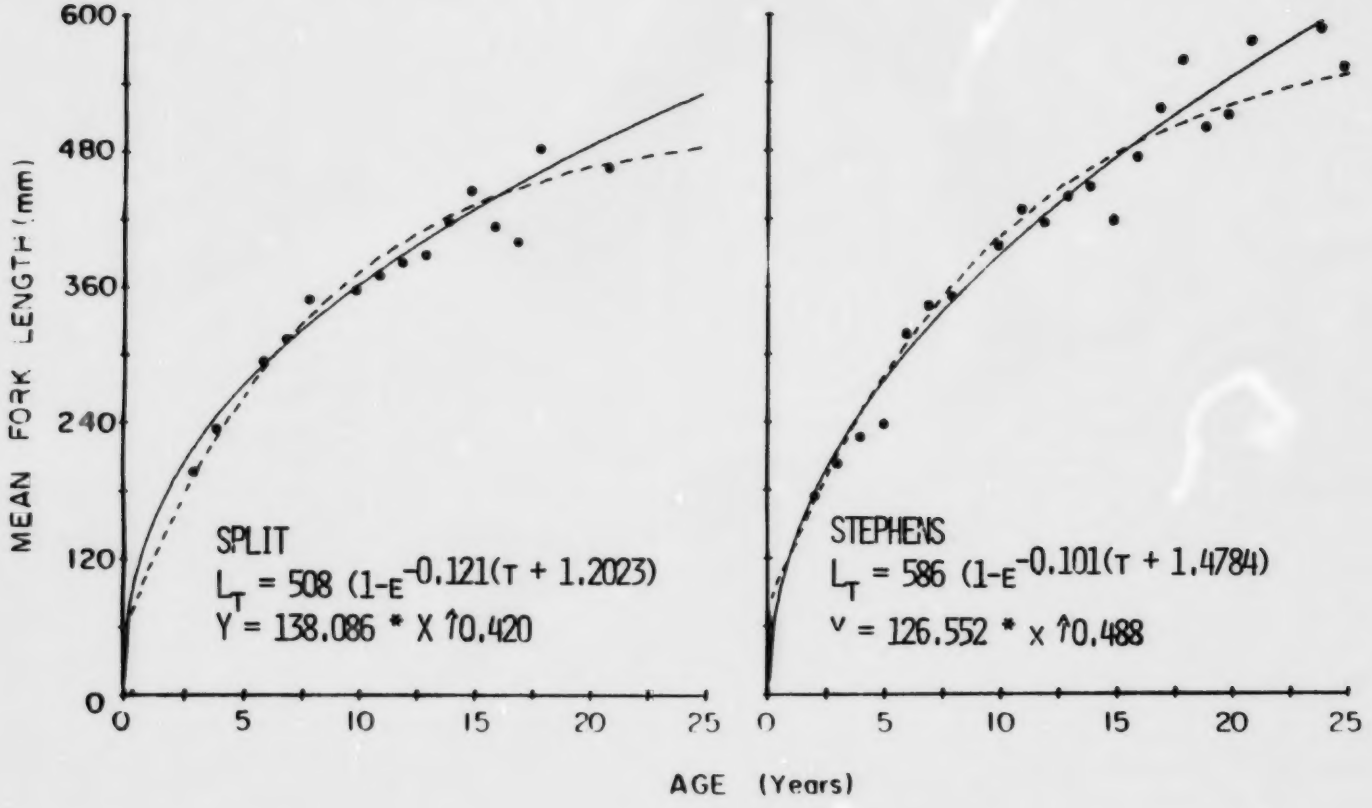

Fig. 24. Von Bertalanffy (---) and power (——) regression curves for walleye from Split and Stephens lakes, 1987.

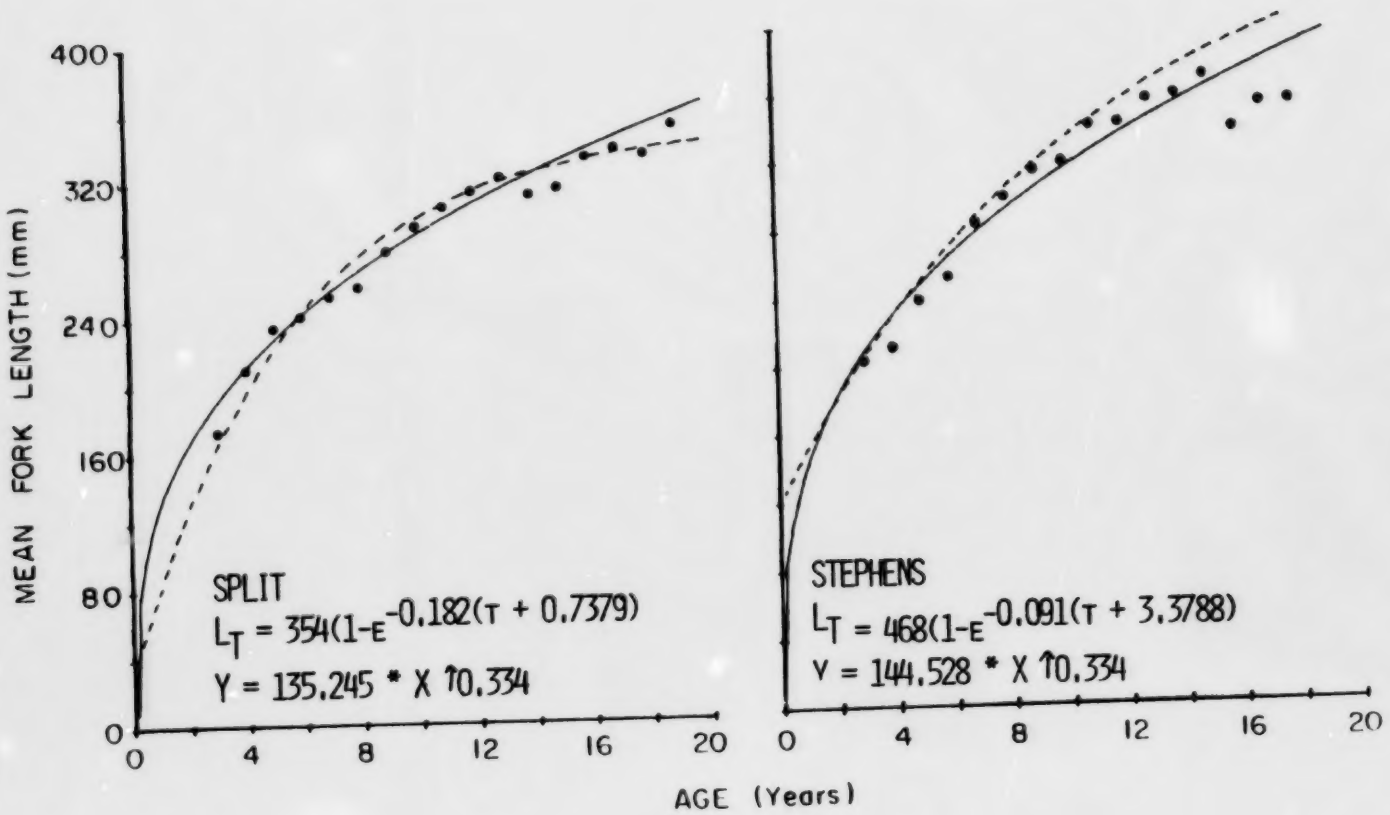

Fig. 25. Von Bertalanffy (---) and power (——) regression curves for sauger from Split and Stephens lakes, 1987.

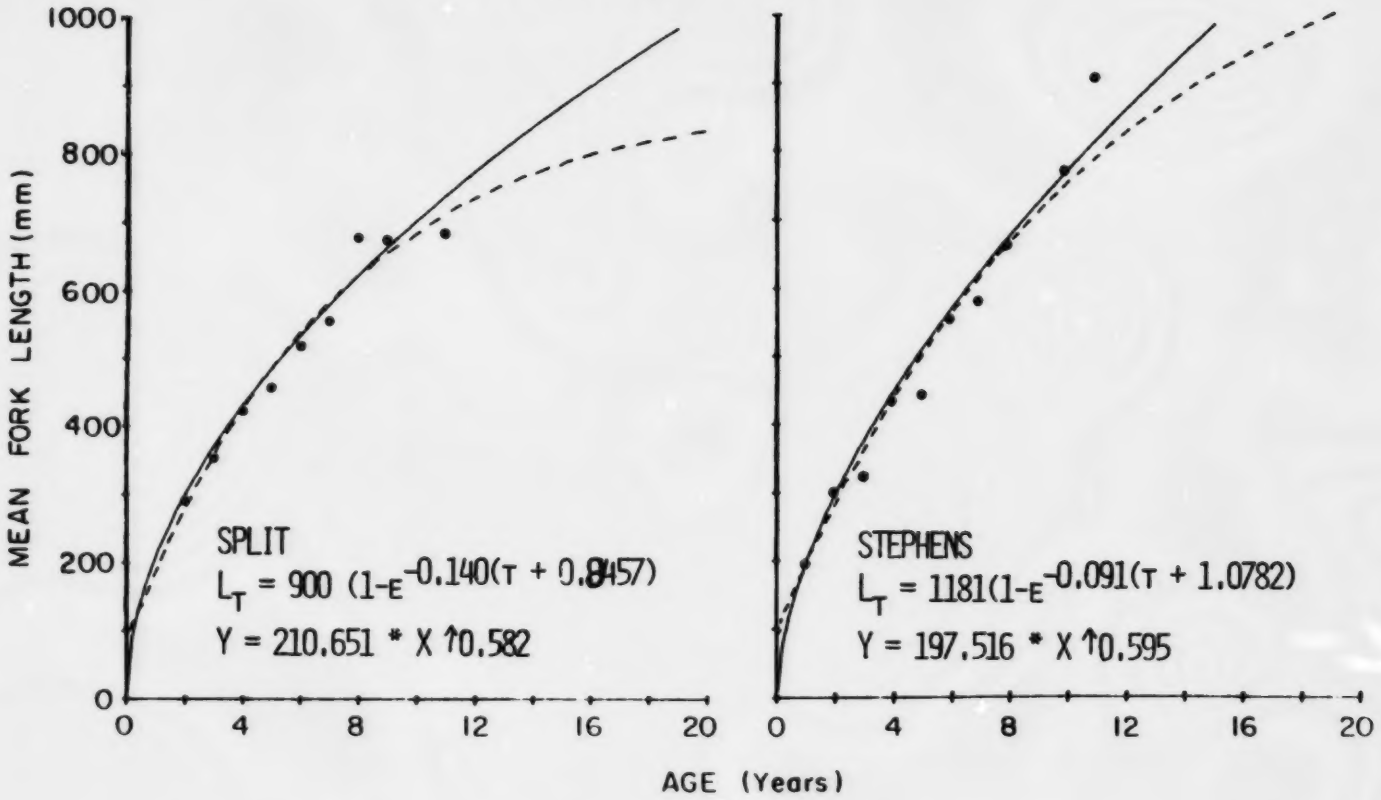

Fig. 26. Von Bertalanffy (---) and power (——) regression curves for northern pike from Split and Stephens lakes, 1987.

Table 1. Catch summary for experimental fishing sets in Split Lake, 1987.

Set no.	Date of set	Whitefish	Walleye	Sauger	Northern pike	Cisco	White sucker	Longnose sucker	Mooneye	Goldeye	Burbot	Yellow perch	Lake chub	Shorthead redhorse	Freshwater drum	Total
1	July 15	16	4	2	2	11	5		109				8	1		158
2	July 15	25	4	5		4	11	1	40				27			117
3	July 15	21	8	25	2		15	2	12		1		19		1	106
4	July 15	3	4	5		2	5	4	11				6			40
5	July 16		3	3	9				126			5				146
6	July 16	3	3	3	6		1		58				1			75
7	July 16	2	1	5	2		1	1	10				1			23
8	July 16	28		4	2		2	16	8		12		1			73
9	July 17	13	4	12	1		10		6				2	1		51
10	July 17			2	1	1	4		19					2		29
11	July 17	4	1			1	11	8	1		7					33
12	July 17	22	2	2			8	30	3		3		10			80
13	July 18	30	1	14		1	14	20	1		6		1			88
14	July 18	47		1	1	7	15	9	1		2					83
15	July 18	51	3	4		7	6	6	9		2		7			95
16	July 18	56	4	6		2	13	36					13			130
17	July 19		2	1	1	3			55							62
18	July 19	1	6		2	4			120							133
19	July 19	3	8	2	2	7	8		33			3				66
20	July 19	3	16	1	3		11		181			2				217
21	July 27	23	15	9	4	15	7	2	48				9			132
22	July 27	8	7	7			41		12			2	3			80
23	July 28	3	9	24	1	2	8					1				48
24	July 28	5	2	5		3	12		10	1		1				39
25	July 28	7		1			7	1	3				1			20
26	July 29	10	4	7			10	1	4			2				38
27	July 29	10	8	2		25	5		62	1			2			115
28	July 29	5	1	3			13					2		1		25
29	July 30	8	1	1		1	7	31			2					51
30	July 30	18	8	3		2	24	3	2		2		4			66
31	July 30	22	5	4	1	3	11	1	9				2			58
Total		447	134	165	40	101	285	172	953	2	37	17	118	5	1	2477

Table 2. Catch summary for experimental fishing sets in Stephens Lake, 1987.

Set no.	Date of set	Whitefish	Walleye	Sauger	Northern pike	Cisco	White sucker	Longnose sucker	Mooneye	Goldeye	Burbot	Yellow perch	Lake chub	Shorthead redhorse	Freshwater drum	Total
1	June 15	3	3	4	3	2	3	2	60					1		80
2	June 15	2	3	18			5	8	1							37
3	June 16		1	34			2	8								45
4	June 16		7	18			2	2	52							81
5	June 17	1	36	20	2		4	3	29	1						96
6	June 17		5	12			3	22	1		2					45
7	June 18		5	1	1		3	2				1				13
8	June 18	1	8	12	1	1	2	1	46							72
9	June 19	2		15				9								26
10	June 20	5	10	6	1		7		48							77
11	June 21	18					9	17					3			47
12	June 21	22		2			11	30	3				1			70
13	June 29	4	4		9	9	2									28
14	June 29		1		4	3										8
15	June 29				12	6										18
16	June 30	5	17		12	2	2									38
17	June 30	3	2		5	14										24
18	June 30	1			10	19						1				31
19	July 1	1	1		5	30			4							41
20	July 1	1	1			78			5							85
21	July 1	8	13	3		11			21				1			57
22	July 2	3	11			2			2				1			19
23	July 2		4			17	1		6				4			32
24	July 2	24				1	2	40			1					72
25	July 3	12	1	4		4	12	10	13				2			54
26	July 3	14						44			1					59
27	July 3	22				3	1	12			2					40
28	July 4	1	10		3	6	3		80				2			106
29	July 4	27						8				1				35
30	July 4	15	1			2		34				1	5			58
31	July 5	23		2		8	3	18			1		1			48
32	July 5	16	2				1	13	11				1			52
33	July 5	3		16		22	5	16							1	41
34	July 13	4	6	4		1		3	14				2			55
35	July 13	41		3			4	65					4			118
36	July 13	11	3	3			7	3								27
37	July 14	29	1	5			2	13	1							51
Total		322	156	182	68	241	96	383	397	1	7	4	27	1	1	1886

Table 3. Catch per unit of effort by number and weight and percent frequency of occurrence for fish species in Split and Stephens lakes, 1987. Numbers in parentheses are the number of standard gangs set in each lake.

Species	CUE (number/gang/day)		CUE (kg/gang/day)		% frequency of occurrence	
	Split (31)	Stephens (37)	Split	Stephens	Split	Stephens
Whitefish	14.4	8.7	12.8	10.7	18.1	17.1
Walleye	4.3	4.2	2.1	3.2	5.4	8.5
Sauger	5.3	4.9	0.9	1.4	6.7	9.4
Northern pike	1.3	1.8	1.5	2.3	1.6	3.6
Cisco	3.2	6.5	0.73	0.8	4.1	12.8
White sucker	9.2	2.6	10.0	2.4	11.5	5.1
Longnose sucker	5.5	10.4	4.4	7.8	6.9	20.3
Shorthead redhorse	0.2	0.03	0.5	0.003	0.2	0.05
Mooneye	30.7	10.7	4.3	1.4	38.5	21.1
Goldeye	0.06	0.03	0.02	0.01	0.08	0.05
Burbot	1.2	0.2	0.4	0.2	1.5	0.4
Yellow perch	0.6	0.1	0.04	0.004	0.7	0.2
Lake chub	3.8	0.8	0.2	0.04	4.7	1.4
Freshwater drum	0.02	0.03	0.06	0.04	0.04	0.05
Total	79.9	51.0	37.70	30.29	100.0	100.0

Table 4. Mesh size effects on the number and total weight (kg) of fish caught in 31 experimental net sets in Split Lake, 1987.

Species	Parameter	Mesh size (inches)						
		1.5	2.0	3.0	3.75	4.25	5.0	Total
Whitefish	N	23	42	102	91	120	69	447
	weights	7.33	22.51	67.24	85.44	130.10	83.09	395.71
Cisco	N	30	29	27	8	7	0	101
	weights	1.75	4.71	8.45	3.92	3.85	0.00	22.68
Walleye	N	22	45	30	21	10	6	134
	weights	5.14	13.62	16.35	16.42	8.32	6.77	66.61
Sauger	N	62	79	19	1	2	2	165
	weights	7.32	12.26	6.30	0.74	0.60	0.48	27.70
Northern pike	N	7	6	14	7	1	5	40
	weights	8.60	3.41	13.39	6.60	3.16	11.79	46.95
White sucker	N	5	7	59	88	80	46	285
	weights	2.34	4.16	47.19	87.25	95.92	71.94	308.80
Longnose sucker	N	8	23	41	51	38	11	172
	weights	2.17	9.02	28.67	45.80	39.15	12.99	137.80
Shorthead redhorse sucker	N	0	1	3	0	0	1	5
	weights	0.00	0.44	3.27	0.00	0.00	0.98	4.69
Mooneye	N	262	421	190	67	11	2	953
	weights	16.09	44.74	48.51	20.81	3.82	0.27	134.23
Goldeye	N	0	1	0	1	0	0	2
	weights	0.00	0.28	0.00	0.48	0.00	0.00	0.76
Yellow perch	N	9	8	0	0	0	0	17
	weights	0.38	0.78	0.00	0.00	0.00	0.00	1.16
Burbot	N	11	13	10	3	0	0	37
	weights	2.22	3.05	5.45	2.41	0.00	0.00	13.13
Freshwater drum	N	0	0	0	0	0	1	1
	weights	0.00	0.00	0.00	0.00	0.00	1.79	1.79
Lake chub	N	113	5	0	0	0	0	118
	weights	6.16	0.50	0.00	0.00	0.00	0.00	6.65
Total	N	552	680	495	338	269	143	2477
	weights	59.49	119.47	244.81	269.87	284.92	190.10	1168.65

Table 5. Mesh size effects on the number and total weight (kg) of fish caught in 37 experimental net sets in Stephens Lake, 1987.

Species	Parameter	Mesh size (inches)							
		1.5	2.0	3.0	3.75	4.25	5.0	5.25	Total
Whitefish	N	3	15	44	80	65	115	0	322
	weights	3.11	17.79	37.87	88.82	90.62	159.49	0.00	397.70
Cisco	N	62	154	24	0	1	0	0	241
	weights	4.75	20.01	5.68	0.00	0.12	0.00	0.00	30.56
Walleye	N	30	31	24	29	24	18	0	156
	weights	4.95	9.08	17.69	24.40	30.15	31.25	0.00	117.52
Sauger	N	36	57	61	17	5	5	0	182
	weights	4.97	10.83	23.91	8.36	1.72	0.98	0.00	51.07
Northern pike	N	16	24	19	5	3	1	0	68
	weights	20.79	24.66	19.04	8.05	8.67	2.56	0.00	83.77
White sucker	N	1	2	19	33	31	10	0	96
	weights	0.04	0.47	12.62	27.15	35.35	14.50	0.00	90.13
Longnose sucker	N	26	62	111	102	60	21	0	383
	weights	14.44	38.98	74.87	83.53	53.48	23.27	0.00	289.63
Shorthead redhorse sucker	N	0	1	0	0	0	0	0	1
	weights	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.11
Mooneye	N	132	137	123	4	0	1	0	397
	weights	7.29	15.88	27.07	0.82	0.00	0.06	0.00	51.12
Goldeye	N	0	0	1	0	0	0	0	1
	weights	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.36
Yellow perch	N	4	0	0	0	0	0	0	4
	weights	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.14
Burbot	N	0	0	3	2	1	1	0	7
	weights	0.00	0.00	1.47	1.80	1.10	1.20	0.00	5.57
Freshwater drum	N	0	0	0	0	0	1	0	1
	weights	0.00	0.00	0.00	0.00	0.00	1.44	0.00	1.44
Lake chub	N	27	0	0	0	0	0	0	27
	weights	1.59	0.00	0.00	0.00	0.00	0.00	0.00	1.59
Total	N	337	483	429	272	190	173	0	1886
	weights	62.06	137.81	220.58	242.93	221.21	234.75	0.00	1120.70

Table 6. Mesh size effects on whitefish catches in Split Lake, 1987.

	Mesh size (inches)						
	150	200	300	375	425	500	Total
Number caught	23	42	102	91	120	69	447
CUE (No/100 yds/day)	2.97	5.42	13.16	11.74	15.48	8.90	9.61
CUE (Kg/100 yds/day)	0.95	2.90	8.68	11.02	16.79	10.72	8.51
Mean Length(mm)	222 ± 102.72	294 ± 85.58	331 ± 58.39	377 ± 54.26	394 ± 40.26	411 ± 28.19	360 ± 73.93
Mean Weight(g)	319 ± 492.17	536 ± 459.87	659 ± 391.70	939 ± 426.66	1084 ± 342.98	1204 ± 266.82	885 ± 460.23
Number Mature	5	10	30	45	75	53	218
Number Immature	18	32	72	46	45	16	229
% Mature	21.7	23.8	29.41	49.5	62.5	76.8	48.8
Mean age (Years)	2.9	4.7	5.2	6.8	7.5	8.4	6.5
Age(years)	Frequency (%)						
1	34.8	0.0	0.0	0.0	0.0	0.0	1.8
2	39.1	26.2	0.0	0.0	0.0	0.0	4.5
3	4.3	31.0	39.2	8.8	0.8	0.0	14.1
4	0.0	4.8	12.7	16.5	6.7	0.0	8.5
5	4.3	2.4	10.8	9.9	13.3	2.9	8.9
6	4.3	9.5	9.8	11.0	10.0	11.6	10.1
7	0.0	2.4	5.9	6.6	7.5	5.8	5.8
8	8.7	7.1	10.8	24.2	33.3	34.8	22.8
9	0.0	9.5	3.9	12.1	15.0	27.5	12.5
10	4.3	4.8	2.9	3.3	10.8	8.7	6.3
11	0.0	2.4	2.0	3.3	0.8	5.8	2.5
12	0.0	0.0	1.0	2.2	0.0	1.4	0.9
13	0.0	0.0	0.0	1.1	0.0	1.4	0.4
14	0.0	0.0	1.0	0.0	1.7	0.0	0.7
15	0.0	0.0	0.0	1.1	0.0	0.0	0.2

Total effort for each mesh size was 775 yards of net.
± = standard deviation
Number with unknown sex = 0
Number with unknown maturity= 0
Number with unknown age = 0

Table 7. Mesh size effects on whitefish catches in Stephens Lake, 1987.

	Mesh size (inches)						
	150	200	300	375	425	500	Total
Number caught	3	15	44	80	65	115	322
CUE (No/100 yds/day)	0.32	1.62	4.76	8.65	7.03	12.43	5.80
CUE (Kg/100 yds/day)	0.34	1.92	4.09	9.60	9.80	17.24	7.17
Mean Length(mm)	386 ± 51.03	398 ± 89.44	371 ± 47.55	398 ± 51.06	424 ± 65.66	434 ± 44.42	412 ± 58.04
Mean Weight(g)	1037 ± 414.05	1186 ± 735.33	861 ± 418.35	1110 ± 497.24	1394 ± 694.48	1387 ± 473.91	1235 ± 567.29
Number Mature	3	9	23	53	49	100	237
Number Immature	0	6	21	27	16	15	85
% Mature	100.0	60.0	52.27	66.3	75.4	87.0	73.6
Mean age (Years)	8.7	9.1	8.0	9.9	11.0	11.3	10.3
Age(years)	Frequency (%)						
3	0.0	6.7	0.0	0.0	0.0	0.0	0.3
4	0.0	0.0	4.5	0.0	0.0	0.0	0.6
5	0.0	0.0	4.5	0.0	3.1	1.7	1.9
6	33.3	20.0	34.1	13.8	21.5	4.3	15.2
7	0.0	13.3	2.3	5.0	7.7	7.8	6.5
8	33.3	26.7	25.0	23.8	6.2	13.9	17.1
9	0.0	6.7	9.1	11.3	4.6	8.7	8.4
10	0.0	0.0	9.1	13.8	4.6	12.2	9.9
11	0.0	0.0	2.3	8.8	6.2	8.7	6.8
12	33.3	0.0	0.0	5.0	4.6	5.2	4.3
13	0.0	0.0	0.0	0.0	1.5	2.6	1.2
14	0.0	6.7	2.3	6.3	3.1	4.3	4.3
15	0.0	6.7	4.5	5.0	12.3	12.2	9.0
16	0.0	13.3	2.3	6.3	23.1	18.3	13.7
18	0.0	0.0	0.0	0.0	1.5	0.0	0.3
19	0.0	0.0	0.0	1.3	0.0	0.0	0.3

Total effort for each mesh size was 925 yards of net.
+ = standard deviation
Number with unknown sex = 0
Number with unknown maturity= 0
Number with unknown age = 0

Table 8. Mesh size effects on walleye catches in Split Lake, 1987.

	Mesh size (inches)						
	150	200	300	375	425	500	Total
Number caught	22	45	30	21	10	6	134
CUE (No/100 yds/day)	2.84	5.81	3.87	2.71	1.29	0.77	2.88
CUE (Kg/100 yds/day)	0.66	1.76	2.11	2.12	1.07	0.87	1.43
Mean Length(mm)	254 ± 80.30	288 ± 63.83	358 ± 43.35	399 ± 72.64	398 ± 71.30	423 ± 104.12	330 ± 86.69
Mean Weight(g)	234 ± 258.72	303 ± 204.09	545 ± 261.28	782 ± 464.53	832 ± 340.48	1128 ± 649.66	497 ± 399.23
Number Mature	0	3	3	7	4	3	20
Number Immature	22	42	27	14	6	3	114
% Mature	0.0	6.7	10	33.3	40.0	50.0	14.9
Mean age (Years)	5.4	5.7	9.3	12.3	12.1	13.0	8.3
Age(years)	Frequency (%)						
3	27.3	15.6	0.0	4.8	0.0	0.0	10.4
4	40.9	40.0	3.3	0.0	10.0	16.7	22.4
6	9.1	13.3	13.3	4.8	0.0	0.0	9.7
7	0.0	2.2	3.3	0.0	0.0	0.0	1.5
8	9.1	17.8	46.7	19.0	10.0	0.0	21.6
10	4.5	2.2	0.0	0.0	0.0	0.0	1.5
11	0.0	4.4	16.7	9.5	10.0	0.0	7.5
12	0.0	2.2	0.0	14.3	0.0	16.7	3.7
13	4.5	2.2	3.3	4.8	10.0	16.7	4.5
14	4.5	0.0	10.0	14.3	50.0	33.3	10.4
15	0.0	0.0	0.0	4.8	10.0	0.0	1.5
16	0.0	0.0	0.0	4.8	0.0	0.0	0.7
17	0.0	0.0	0.0	4.8	0.0	0.0	0.7
18	0.0	0.0	0.0	9.5	0.0	0.0	1.5
21	0.0	0.0	3.3	4.8	0.0	16.7	2.2

Total effort for each mesh size was 775 yards of net.
± = standard deviation
Number with unknown sex = 0
Number with unknown maturity= 0
Number with unknown age = 0

Table 9. Mesh size effects on walleye catches in Stephens Lake, 1987.

	Mesh size (inches)						
	150	200	300	375	425	500	Total
Number caught	30	31	24	29	24	18	156
CUE (No/100 yds/day)	3.24	3.35	2.59	3.14	2.59	1.95	2.81
CUE (Kg/100 yds/day)	0.53	0.98	1.91	2.64	3.26	3.38	2.12
Mean Length(mm)	226 ± 62.64	274 ± 75.32	387 ± 74.72	408 ± 46.05	460 ± 66.87	522 ± 49.29	364 ± 118.37
Mean Weight(g)	165 ± 298.30	293 ± 365.41	737 ± 532.28	841 ± 314.48	1256 ± 482.86	1736 ± 503.87	753 ± 653.52
Number Mature	2	5	9	19	22	18	75
Number Immature	28	26	15	10	2	0	81
% Mature	6.7	16.1	37.5	65.5	91.7	100.0	48.1
Mean age (Years)	4.4	5.2	9.8	11.3	14.0	16.8	9.6
Age(years)	Frequency (%)						
2	3.3	0.0	0.0	0.0	0.0	0.0	0.6
3	10.0	6.5	0.0	0.0	0.0	0.0	3.2
4	60.0	61.3	4.2	0.0	4.2	0.0	25.0
5	20.0	12.9	4.2	0.0	0.0	0.0	7.1
6	3.3	9.7	20.8	10.3	0.0	0.0	7.7
7	0.0	0.0	0.0	6.9	0.0	0.0	1.3
8	0.0	3.2	16.7	10.3	4.2	0.0	5.8
10	0.0	0.0	4.2	6.9	4.2	0.0	2.6
11	0.0	0.0	16.7	3.4	0.0	0.0	3.2
12	0.0	0.0	20.8	13.8	16.7	16.7	10.3
13	0.0	0.0	4.2	24.1	12.5	11.1	8.3
14	3.3	3.2	0.0	17.2	25.0	11.1	9.6
15	0.0	0.0	4.2	3.4	4.2	0.0	1.9
16	0.0	0.0	0.0	3.4	4.2	5.6	1.9
17	0.0	0.0	0.0	0.0	8.3	27.8	4.5
18	0.0	0.0	0.0	0.0	4.2	5.6	1.3
19	0.0	0.0	0.0	0.0	4.2	0.0	0.6
20	0.0	3.2	0.0	0.0	8.3	0.0	1.9
21	0.0	0.0	4.2	0.0	0.0	5.6	1.3
24	0.0	0.0	0.0	0.0	0.0	11.1	1.3
25	0.0	0.0	0.0	0.0	0.0	5.6	0.6

Total effort for each mesh size was 925 yards of net.
± = standard deviation
Number with unknown sex = 0
Number with unknown maturity= 0
Number with unknown age = 0

Table 10. Mesh size effects on sauger catches in Split Lake, 1987.

	Mesh size (inches)						
	150	200	300	375	425	500	Total
Number caught	62	79	19	1	2	2	165
CUE (No/100 yds/day)	8.00	10.19	2.45	0.13	0.26	0.26	3.55
CUE (Kg/100 yds/day)	0.95	1.58	0.81	0.10	0.08	0.06	0.60
Mean Length(mm)	226 ± 34.43	252 ± 24.58	317 ± 40.01	406 ± -	312 ± 79.20	255 ± 117.38	252 ± 44.37
Mean Weight(g)	118 ± 62.42	155 ± 49.09	332 ± 104.58	740 ± -	300 ± 183.85	238 ± 272.24	168 ± 104.11
Number Mature	1	5	7	1	0	0	14
Number Immature	61	74	12	0	2	2	151
% Mature	1.6	6.3	36.84	100.0	0.0	0.0	8.5
Mean age (Years)	5.0	6.3	12.9	11.0	13.0	8.0	6.7
Age(years)	Frequency (%)						
3	9.7	0.0	0.0	0.0	0.0	50.0	4.2
4	51.6	17.7	5.3	0.0	0.0	0.0	28.5
5	4.8	15.2	5.3	0.0	0.0	0.0	9.7
6	22.6	49.4	5.3	0.0	0.0	0.0	32.7
7	0.0	1.3	0.0	0.0	0.0	0.0	0.6
8	4.8	5.1	0.0	0.0	0.0	0.0	4.2
9	1.6	0.0	0.0	0.0	0.0	0.0	0.6
10	1.6	1.3	10.5	0.0	50.0	0.0	3.0
11	1.6	3.8	0.0	100.0	0.0	0.0	3.0
12	1.6	2.5	10.5	0.0	0.0	0.0	3.0
13	0.0	2.5	15.8	0.0	0.0	50.0	3.6
14	0.0	0.0	10.5	0.0	0.0	0.0	1.2
15	0.0	0.0	10.5	0.0	0.0	0.0	1.2
16	0.0	1.3	0.0	0.0	50.0	0.0	1.2
17	0.0	0.0	10.5	0.0	0.0	0.0	1.2
18	0.0	0.0	10.5	0.0	0.0	0.0	1.2
19	0.0	0.0	5.3	0.0	0.0	0.0	0.6

Total effort for each mesh size was 775 yards of net.
± = standard deviation
Number with unknown sex = 0
Number with unknown maturity= 0
Number with unknown age = 0

Table 11. Mesh size effects on sauger catches in Stephens Lake, 1987.

	Mesh size (inches)						
	150	200	300	375	425	500	Total
Number caught	36	57	61	17	5	5	182
CUE (No/100 yds/day)	3.89	6.16	6.59	1.84	0.54	0.54	3.28
CUE (Kg/100 yds/day)	0.54	1.17	2.58	0.90	0.19	0.11	0.92
Mean Length(mm)	235 ± 43.46	261 ± 39.02	333 ± 27.54	359 ± 41.03	314 ± 47.17	267 ± 17.92	291 ± 57.12
Mean Weight(g)	138 ± 94.89	190 ± 103.83	392 ± 93.09	492 ± 144.75	344 ± 119.71	196 ± 40.99	281 ± 159.58
Number Mature	12	21	50	14	5	2	105
Number Immature	24	36	11	3	0	3	77
% Mature	33.3	36.8	81.96	82.4	100.0	40.0	57.7
Mean age (Years)	5.0	6.1	11.0	11.9	8.0	6.4	8.2
Age(years)	Frequency (%)						
3	8.3	1.8	0.0	0.0	0.0	0.0	2.2
4	52.8	22.8	1.6	0.0	20.0	0.0	18.7
5	2.8	21.1	0.0	0.0	0.0	0.0	7.1
6	19.4	35.1	0.0	5.9	0.0	80.0	17.6
7	5.6	0.0	3.3	0.0	0.0	0.0	2.2
8	0.0	7.0	9.8	5.9	60.0	20.0	8.2
9	0.0	1.8	13.1	0.0	0.0	0.0	4.9
10	0.0	1.8	23.0	11.8	0.0	0.0	9.9
11	2.8	3.5	11.5	17.6	0.0	0.0	7.1
12	5.6	0.0	18.0	29.4	20.0	0.0	10.4
13	0.0	5.3	3.3	5.9	0.0	0.0	3.3
14	0.0	0.0	3.3	5.9	0.0	0.0	1.6
15	0.0	0.0	0.0	5.9	0.0	0.0	0.5
16	0.0	0.0	6.6	0.0	0.0	0.0	2.2
17	0.0	0.0	4.9	11.8	0.0	0.0	2.7
18	0.0	0.0	1.6	0.0	0.0	0.0	0.5

Total effort for each mesh size was 925 yards of net.
± = standard deviation
Number with unknown sex = 0
Number with unknown maturity= 0
Number with unknown age = 1

Table 12. Mesh size effects on northern pike catches in Split Lake, 1987.

	Mesh size (inches)						
	150	200	300	375	425	500	Total
Number caught	7	6	14	7	1	5	40
CUE (No/100 yds/day)	0.90	0.77	1.81	0.90	0.13	0.65	0.86
CUE (Kg/100 yds/day)	1.11	0.44	1.73	0.85	0.41	1.52	1.01
Mean Length(mm)	538 ± 100.79	423 ± 140.99	519 ± 73.88	518 ± 35.63	758 ± -	626 ± 143.03	527 ± 112.05
Mean Weight(g)	1229 ± 720.94	568 ± 516.89	956 ± 383.78	943 ± 266.94	3160 ± -	2358 ±1209.84	1174 ± 829.94
Number Mature	4	1	6	1	0	2	14
Number Immature	3	5	8	6	1	3	26
% Mature	57.1	16.7	42.85	14.3	0.0	40.0	35.0
Mean age (Years)	5.9	4.0	5.9	5.6	8.0	7.8	5.8
Age(years)	Frequency (%)						
2	0.0	16.7	0.0	0.0	0.0	0.0	2.5
3	14.3	33.3	7.1	0.0	0.0	0.0	10.0
4	0.0	33.3	7.1	0.0	0.0	0.0	7.5
5	14.3	0.0	28.6	57.1	0.0	20.0	25.0
6	42.9	0.0	35.7	28.6	0.0	0.0	25.0
7	14.3	0.0	14.3	14.3	0.0	0.0	10.0
8	14.3	16.7	0.0	0.0	100.0	40.0	12.5
9	0.0	0.0	0.0	0.0	0.0	40.0	5.0
11	0.0	0.0	7.1	0.0	0.0	0.0	2.5

Total effort for each mesh size was 775 yards of net.
± = standard deviation
Number with unknown sex = 0
Number with unknown maturity= 0
Number with unknown age = 0

Table 13. Mesh size effects on northern pike catches in Stephens Lake, 1987.

	Mesh size (inches)						
	150	200	300	375	425	500	Total
Number caught	16	24	19	5	3	1	68
CUE (No/100 yds/day)	1.73	2.59	2.05	0.54	0.32	0.11	1.23
CUE (Kg/100 yds/day)	2.25	2.67	2.06	0.87	0.94	0.28	1.51
Mean Length(mm)	498 ± 199.49	450 ± 179.64	508 ± 87.27	619 ± 97.98	735 ± 135.37	696 ± -	506 ± 167.74
Mean Weight(g)	1299 ±1641.23	1028 ±1766.97	1002 ± 752.39	1610 ± 836.30	2890 ±1531.89	2560 ± -	1232 ±1459.40
Number Mature	8	10	10	3	3	1	35
Number Immature	8	14	9	1	0	0	32
% Mature	50.0	41.7	52.63	75.0	100.0	100.0	52.2
Mean age (Years)	5.3	4.1	5.6	7.0	7.7	10.0	5.3
Age(years)	Frequency (%)						
1	6.3	0.0	0.0	0.0	0.0	0.0	1.5
2	6.3	29.2	0.0	0.0	0.0	0.0	11.8
3	18.8	20.8	5.3	0.0	0.0	0.0	13.2
4	6.3	20.8	31.6	20.0	0.0	0.0	19.1
5	12.5	4.2	15.8	0.0	0.0	0.0	8.8
6	25.0	4.2	15.8	20.0	33.3	0.0	14.7
7	6.3	12.5	21.1	20.0	33.3	0.0	14.7
8	12.5	4.2	5.3	20.0	0.0	0.0	7.4
10	0.0	4.2	5.3	20.0	33.3	100.0	7.4
11	6.3	0.0	0.0	0.0	0.0	0.0	1.5

Total effort for each mesh size was 925 yards of net.
± = standard deviation
Number with unknown sex = 1
Number with unknown maturity= 1
Number with unknown age = 0

Table 14. Mesh size effects on white sucker, longnose sucker and shorthead redhorse sucker catches from Split Lake, 1987.

Species		Mesh size (inches)						
		150	200	300	375	425	500	Total
White sucker	Number caught	5	7	59	88	80	46	285
	CUE (No/100 yds/day)	0.65	0.90	7.61	11.35	10.32	5.94	6.13
	CUE (Kg/100 yds/day)	0.30	0.54	6.09	11.26	12.38	9.28	6.64
	Mean Length(mm)	262 ± 115.69	330 ± 45.33	364 ± 37.25	389 ± 36.79	412 ± 29.60	447 ± 29.75	396 ± 49.57
	Mean Weight(g)	468 ± 664.14	594 ± 257.28	800 ± 263.76	991 ± 312.49	1199 ± 258.61	1564 ± 270.88	1084 ± 393.72
Longnose sucker	Number caught	8	23	41	51	38	11	172
	CUE (No/100 yds/day)	1.03	2.97	5.29	6.58	4.90	1.42	3.70
	CUE (Kg/100 yds/day)	0.28	1.16	3.70	5.91	5.05	1.6[illegible]	2.96
	Mean Length(mm)	237 ± 100.32	284 ± 76.86	360 ± 45.45	391 ± 28.65	409 ± 29.60	428 ± 23.90	368 ± 68.32
	Mean Weight(g)	271 ± 295.20	392 ± 284.89	699 ± 256.56	898 ± 195.45	1030 ± 215.34	1181 ± 218.15	801 ± 339.46
Shorthead redhorse	Number caught		1	3			1	5
	CUE (No/100 yds/day)		0.13	0.39			0.13	0.11
	CUE (Kg/100 yds/day)		0.06	0.42			0.13	0.10
	Mean Length(mm)		298 ± -	400 ± 20.88			380 ± -	376 ± 46.63
	Mean Weight(g)		440 ± -	1090 ± 226.50			980 ± -	938 ± 324.68

Table 15. Mesh size effects on white sucker, longnose sucker and shorthead redhorse sucker catches from Stephens Lake, 1987.

Species		Mesh size (inches)						
		150	200	300	375	425	500	Total
White sucker	Number caught	1	2	19	33	31	10	96
	CUE (No/100 yds/day)	0.11	0.22	2.05	3.57	3.35	1.08	1.73
	CUE (Kg/100 yds/day)	0.00	0.05	1.36	2.94	3.82	1.57	1.62
	Mean Length(mm)	156 ± -	233 ± 12.73	338 ± 31.92	366 ± 25.73	405 ± 33.78	441 ± 27.57	376 ± 53.35
	Mean Weight(g)	40 ± -	235 ± 21.21	664 ± 186.29	823 ± 179.99	1140 ± 318.66	1450 ± 232.90	939 ± 366.26
Longnose sucker	Number caught	26	62	111	102	60	21	383
	CUE (No/100 yds/day)	2.81	6.70	12.00	11.03	6.49	2.27	6.90
	CUE (Kg/100 yds/day)	1.56	4.21	8.09	9.03	5.88	2.52	5.23
	Mean Length(mm)	331 ± 55.22	343 ± 49.63	353 ± 37.37	381 ± 33.74	394 ± 30.38	417 ± 27.40	368 ± 45.06
	Mean Weight(g)	555 ± 253.60	629 ± 252.44	675 ± 207.76	819 ± 196.59	906 ± 189.92	1108 ± 208.32	759 ± 252.65
Shorthead redhorse	Number caught		1					1
	CUE (No/100 yds/day)		0.11					0.02
	CUE (Kg/100 yds/day)		0.01					0.00
	Mean Length(mm)		210 ± -					210 ± -
	Mean Weight(g)		110 ± -					110 ± -

Table 16. Mesh size effects on cisco, mooneye and goldeye catches from Split Lake, 1987.

Species		Mesh size (inches)						
		150	200	300	375	425	500	Total
Cisco	Number caught	30	29	27	8	7		101
	Number sampled	14	29	27	8	7		85
	CUE (No/100 yds/day)	3.87	3.74	3.48	1.03	0.90		2.17
	CUE (Kg/100 yds/day) *	0.23	0.61	1.09	0.51	0.50		0.49
	Mean Length(mm) *	160 ± 29.06	214 ± 36.91	266 ± 24.02	304 ± 36.35	317 ± 29.12		239 ± 57.75
	Mean Weight(g) *	66 ± 54.92	162 ± 90.24	313 ± 90.50	490 ± 183.23	550 ± 132.41		257 ± 179.58
Mooneye	Number caught	262	421	190	67	11	2	953
	Number sampled	109	242	190	67	11	2	621
	CUE (No/100 yds/day)	33.80	54.32	24.52	8.65	1.42	0.26	20.49
	CUE (Kg/100 yds/day) *	2.08	5.77	6.26	2.69	0.49	0.03	2.89
	Mean Length(mm) *	171 ± 34.67	204 ± 31.51	256 ± 20.77	272 ± 19.82	274 ± 39.63	221 ± 15.56	223 ± 45.42
	Mean Weight(g) *	80 ± 64.73	130 ± 68.68	255 ± 62.97	311 ± 68.42	347 ± 113.62	135 ± 21.21	183 ± 106.27
Goldeye	Number caught		1		1			2
	CUE (No/100 yds/day)		0.13		0.13			0.04
	CUE (Kg/100 yds/day)		0.04		0.06			0.02
	Mean Length(mm)		284 ± -		346 ± -			315 ± 43.84
	Mean Weight(g)		280 ± -		480 ± -			380 ± 141.42

* Calculated on number sampled

Table 17. Mesh size effects on cisco, mooneye and goldeye catches from Stephens Lake, 1987.

Species		Mesh size (inches)						
		150	200	300	375	425	500	Total
Cisco	Number caught	62	154	24		1		241
	CUE (No/100 yds/day)	6.70	16.65	2.59		0.11		4.34
	CUE (Kg/100 yds/day)	0.51	2.16	0.61		0.01		0.55
	Mean Length(mm)	174 ± 37.37	209 ± 21.96	255 ± 15.45		200 ± -		205 ± 34.51
	Mean Weight(g)	77 ± 59.12	130 ± 45.54	237 ± 47.24		120 ± -		127 ± 65.49
Mooneye	Number caught	132	137	123	4		1	397
	CUE (No/100 yds/day)	14.27	14.81	13.30	0.43		0.11	7.15
	CUE (Kg/100 yds/day)	0.79	1.72	2.92	0.09		0.01	0.92
	Mean Length(mm)	162 ± 24.67	202 ± 28.77	247 ± 10.95	247 ± 11.00		162 ± -	203 ± 41.21
	Mean Weight(g)	55 ± 42.85	116 ± 55.29	220 ± 32.25	205 ± 34.16		60 ± -	129 ± 80.55
Goldeye	Number caught			1				1
	CUE (No/100 yds/day)			0.11				0.02
	CUE (Kg/100 yds/day)			0.04				0.01
	Mean Length(mm)			294 ± -				294 ± -
	Mean Weight(g)			360 ± -				360 ± -

Table 18. Mesh size effects on burbot, yellow perch, lake chub and freshwater drum catches from Split Lake, 1987.

Species		Mesh size (inches)						
		150	200	300	375	425	500	Total
Burbot	Number caught	11	13	10	3			37
	CUE (No/100 yds/day)	1.42	1.68	1.29	0.39			0.80
	CUE (Kg/100 yds/day)	0.29	0.39	0.70	0.31			0.28
	Mean Length(mm)	293 ± 89.47	310 ± 73.91	441 ± 37.17	509 ± 29.01			356 ± 101.69
	Mean Weight(g)	201 ± 170.77	235 ± 179.57	545 ± 118.72	803 ± 47.26			355 ± 248.43
Yellow perch	Number caught	9	8					17
	CUE (No/100 yds/day)	1.16	1.03					0.37
	CUE (Kg/100 yds/day)	0.05	0.10					0.03
	Mean Length(mm)	142 ± 7.24	176 ± 19.38					158 ± 21.99
	Mean Weight(g)	43 ± 7.31	97 ± 34.45					68 ± 36.58
Lake chub	Number caught	113	5					118
	CUE (No/100 yds/day)	14.58	0.65					2.54
	CUE (Kg/100 yds/day)	0.79	0.06					0.14
	Mean Length(mm)	156 ± 10.99	193 ± 18.14					158 ± 13.50
	Mean Weight(g)	54 ± 16.09	99 ± 27.08					56 ± 18.84
Freshwater drum	Number caught						1	1
	CUE (No/100 yds/day)						0.13	0.02
	CUE (Kg/100 yds/day)						0.23	0.04
	Mean Length(mm)						452 ± -	452 ± -
	Mean Weight(g)						1790 ± -	1790 ± -

Table 19. Mesh size effects on burbot, yellow perch, lake chub and freshwater drum cathces from Stephens Lake, 1987.

Species		Mesh size (inches)						
		150	200	300	375	425	500	Total
Burbot	Number caught			3	2	1	1	7
	CUE (No/100 yds/day)			0.32	0.22	0.11	0.11	0.13
	CUE (Kg/100 yds/day)			0.16	0.19	0.12	0.13	0.10
	Mean Length(mm)			411 ± 34.49	503 ± 18.38	520 ± -	568 ± -	475 ± 67.55
	Mean Weight(g)			490 ± 45.83	900 ± 56.57	1100 ± -	1200 ± -	796 ± 307.02
Yellow perch	Number caught	4						4
	CUE (No/100 yds/day)	0.43						0.07
	CUE (Kg/100 yds/day)	0.02						0.00
	Mean Length(mm)	139 ± 11.00						139 ± 11.00
	Mean Weight(g)	36 ± 12.45						36 ± 12.45
Lake chub	Number caught	27						27
	CUE (No/100 yds/day)	2.92						0.49
	CUE (Kg/100 yds/day)	0.17						0.03
	Mean Length(mm)	166 ± 16.91						166 ± 16.91
	Mean Weight(g)	59 ± 17.38						59 ± 17.38
Freshwater drum	Number caught						1	1
	CUE (No/100 yds/day)						0.11	0.02
	CUE (Kg/100 yds/day)						0.16	0.03
	Mean Length(mm)						414 ± -	414 ± -
	Mean Weight(g)						1440 ± -	1440 ± -

Table 20. Age-specific size and maturity conditions for whitefish from Split Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)		Wt ± s.d. (g)		Mean Condition Factor
	1	4	0	0.0	142	12.44	40	11.44	1.38
Males	2	14	0	0.0	185	21.05	97	38.71	1.45
	3	45	2	4.4	276	23.81	321	71.87	1.51
	4	17	0	0.0	310	19.87	460	99.81	1.52
	5	28	5	17.9	344	19.90	661	105.49	1.61
	6	27	9	33.3	371	19.54	833	143.84	1.62
	7	14	12	85.7	400	13.03	1081	126.79	1.68
	8	51	44	86.3	398	19.35	1097	194.32	1.73
	9	33	32	97.0	415	19.70	1238	183.30	1.72
	10	13	12	92.3	422	25.77	1292	235.69	1.70
	11	5	5	100.0	442	19.67	1560	284.69	1.80
	12	4	4	100.0	451	11.49	1510	106.46	1.65
	13	1	1	100.0	488	-	1930	-	1.66
	14	1	1	100.0	488	-	1800	-	1.55
	15	1	1	100.0	490	-	1780	-	1.51
Total		258	128	49.6	353	74.76	825	443.66	1.63
	1	4	1	25.0	165	28.11	66	44.12	1.32
Females	2	6	0	0.0	184	20.99	92	29.44	1.41
	3	18	0	0.0	274	16.17	329	67.81	1.59
	4	21	0	0.0	316	20.21	500	106.72	1.56
	5	12	1	8.3	344	23.35	688	126.93	1.67
	6	18	5	27.8	372	14.66	875	133.25	1.69
	7	12	6	50.0	394	23.75	1054	207.38	1.71
	8	51	38	74.5	407	20.74	1188	201.31	1.76
	9	23	17	73.9	422	20.48	1332	213.49	1.76
	10	15	14	93.3	442	24.87	1573	295.60	1.81
	11	6	5	83.3	442	29.78	1507	391.49	1.73
	13	1	1	100.0	496	-	1730	-	1.42
	14	2	2	100.0	462	16.97	1690	141.42	1.71
Total		189	90	47.6	371	71.73	967	470.81	1.68
	1	8	1	12.5	153	23.44	53	32.75	1.35
Both	2	20	0	0.0	185	20.47	95	35.47	1.44
	3	63	2	3.2	276	21.80	323	70.28	1.53
	4	38	0	0.0	313	20.04	482	104.26	1.54
	5	40	6	15.0	344	20.69	669	111.35	1.63
	6	45	14	31.1	372	17.58	850	139.72	1.65
	7	26	18	69.2	397	18.65	1069	165.75	1.69
	8	102	82	80.4	402	20.45	1143	202.08	1.74
	9	56	49	87.5	418	20.19	1276	199.91	1.74
	10	28	26	92.9	433	26.76	1442	300.63	1.76
	11	11	10	90.9	442	24.46	1531	331.40	1.76
	12	4	4	100.0	451	11.49	1510	106.46	1.65
	13	2	2	100.0	492	5.66	1830	141.42	1.54
	14	3	3	100.0	471	19.22	1727	118.46	1.66
	15	1	1	100.0	490	-	1780	-	1.51
Total		447	218	48.8	360	73.93	885	460.23	1.65

± = standard deviation
Number of fish with unknown age that were excluded = 0
Number of fish with unknown sex that were excluded = 0
Number of fish with unknown mat that were excluded = 0

Table 21. Age-specific size and maturity conditions for whitefish from Stephens Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)		Wt ± s.d. (g)		Mean Condition Factor
Males	3	1	0	0.0	214	-	150	-	1.53
	4	2	0	0.0	306	19.80	410	56.57	1.43
	5	5	2	40.0	350	35.83	634	185.15	1.45
	6	19	2	10.5	342	25.81	588	154.07	1.45
	7	9	7	77.8	368	33.19	767	241.66	1.51
	8	30	24	80.0	381	28.07	905	188.20	1.61
	9	13	11	84.6	394	31.41	1025	265.47	1.64
	10	16	15	93.8	416	26.95	1185	258.64	1.63
	11	8	7	87.5	435	21.00	1401	175.21	1.70
	12	8	7	87.5	457	17.00	1506	352.70	1.58
	13	4	4	100.0	468	25.56	1800	451.88	1.73
	14	7	7	100.0	462	28.38	1746	372.82	1.75
	15	23	23	100.0	467	20.76	1768	321.40	1.72
	16	29	29	100.0	487	27.85	1999	403.94	1.71
Total		174	138	79.3	418	59.65	1281	581.09	1.63
Females	5	1	0	0.0	336	-	590	-	1.56
	6	30	7	23.3	349	26.62	670	178.89	1.54
	7	12	4	33.3	390	58.40	1019	562.24	1.61
	8	25	14	56.0	387	33.52	947	220.28	1.62
	9	14	12	85.7	391	31.70	984	242.16	1.62
	10	16	14	87.5	422	18.80	1292	204.46	1.71
	11	14	13	92.9	426	44.43	1371	412.92	1.71
	12	6	6	100.0	420	34.54	1297	252.80	1.74
	14	7	7	100.0	449	31.38	1569	339.33	1.71
	15	6	6	100.0	463	28.25	1725	315.33	1.73
	16	15	14	93.3	487	47.57	2091	628.09	1.76
	18	1	1	100.0	508	-	2140	-	1.63
	19	1	1	100.0	508	-	1900	-	1.45
Total		148	99	66.9	406	55.62	1181	547.61	1.65
Both	3	1	0	0.0	214	-	150	-	1.53
	4	2	0	0.0	306	19.80	410	56.57	1.43
	5	6	2	33.3	348	32.56	627	166.57	1.46
	6	49	9	18.4	346	26.29	639	172.81	1.51
	7	21	11	52.4	380	49.46	911	462.19	1.57
	8	55	38	69.1	384	30.52	924	202.57	1.61
	9	27	23	85.2	392	31.02	1004	249.54	1.63
	10	32	29	90.6	419	23.11	1238	235.67	1.67
	11	22	20	90.9	429	37.30	1382	340.60	1.71
	12	14	13	92.9	441	31.34	1416	321.17	1.65
	13	4	4	100.0	468	25.56	1800	451.88	1.73
	14	14	14	100.0	455	29.58	1657	354.61	1.73
	15	29	29	100.0	466	22.00	1759	315.01	1.72
	16	44	43	97.7	487	35.24	2030	486.48	1.73
	18	1	1	100.0	508	-	2140	-	1.63
	19	1	1	100.0	508	-	1900	-	1.45
Total		322	237	73.6	412	58.04	1235	567.29	1.64

± = standard deviation
Number of fish with unknown age that were excluded = 0
Number of fish with unknown sex that were excluded = 0
Number of fish with unknown mat that were excluded = 0

Table 22. Age-specific size and maturity conditions for walleye from Split Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)		Wt ± s.d. (g)		Mean Condition Factor
Males	3	7	1	14.3	197	23.00	86	34.47	1.07
	4	17	0	0.0	242	26.49	169	71.15	1.13
	6	10	0	0.0	305	41.44	309	102.10	1.03
	7	2	0	0.0	323	9.90	373	18.38	1.11
	8	10	0	0.0	345	21.40	465	106.90	1.11
	10	2	0	0.0	367	41.01	585	190.92	1.16
	11	5	0	0.0	378	21.33	600	88.60	1.10
	12	3	1	33.3	389	24.19	763	130.51	1.29
	13	3	0	0.0	383	30.29	593	126.62	1.05
	14	6	3	50.0	409	26.79	802	210.94	1.15
	17	1	1	100.0	410	-	930	-	1.35
	18	1	0	0.0	400	-	640	-	1.00
	21	2	1	50.0	450	45.25	1250	438.41	1.34
Total		69	7	10.1	315	77.33	421	298.35	1.12
Females	3	7	0	0.0	214	25.83	112	40.85	1.10
	4	13	0	0.0	244	36.31	160	71.95	1.02
	6	3	0	0.0	296	43.86	280	121.66	1.02
	8	19	2	10.5	367	21.91	552	123.13	1.10
	11	5	1	20.0	381	79.87	692	346.94	1.11
	12	2	0	0.0	397	7.07	680	42.43	1.09
	13	3	1	33.3	413	43.10	863	228.98	1.21
	14	8	5	62.5	442	39.08	1050	295.73	1.22
	15	2	2	100.0	455	1.41	1070	28.28	1.14
	16	1	0	0.0	424	-	810	-	1.06
	18	1	1	100.0	584	-	2580	-	1.30
	21	1	1	100.0	526	-	2000	-	1.37
Total		65	13	20.0	345	93.76	577	473.22	1.11
Both	3	14	1	7.1	205	25.07	99	38.71	1.09
	4	30	0	0.0	243	30.56	165	70.42	1.08
	6	13	0	0.0	303	40.30	302	102.19	1.03
	7	2	0	0.0	323	9.90	373	18.38	1.11
	8	29	2	6.9	359	23.78	522	123.27	1.11
	10	2	0	0.0	367	41.01	585	190.92	1.16
	11	10	1	10.0	380	55.13	646	243.59	1.11
	12	5	1	20.0	392	17.97	730	105.12	1.21
	13	6	1	16.7	398	37.15	728	221.94	1.13
	14	14	8	57.1	428	37.14	944	283.67	1.19
	15	2	2	100.0	455	1.41	1070	28.28	1.14
	16	1	0	0.0	424	-	810	-	1.06
	17	1	1	100.0	410	-	930	-	1.35
	18	2	1	50.0	492	130.11	1610	1371.79	1.15
	21	3	2	66.7	475	54.31	1500	532.54	1.35
Total		134	20	14.9	330	86.69	497	399.23	1.11

± = standard deviation
Number of fish with unknown age that were excluded = 0
Number of fish with unknown sex that were excluded = 0
Number of fish with unknown mat that were excluded = 0

Table 23. Age-specific size and maturity conditions for walleye from Stephens Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl + s.d. (mm)		Wt + s.d. (g)		Mean Condition Factor
Males	4	18	2	11.1	234	21.89	142	49.44	1.07
	5	5	1	20.0	251	33.21	180	87.18	1.07
	6	5	2	40.0	317	16.41	378	44.94	1.19
	7	2	1	50.0	352	11.31	500	28.28	1.15
	8	4	3	75.0	358	26.90	520	111.95	1.12
	10	2	2	100.0	377	46.67	665	190.92	1.23
	11	1	1	100.0	462	-	520	-	0.53
	13	6	6	100.0	411	20.03	842	98.47	1.21
	14	4	3	75.0	409	8.25	830	129.10	1.21
	16	1	1	100.0	470	-	1220	-	1.18
	19	1	1	100.0	510	-	1460	-	1.10
	20	1	1	100.0	454	-	1060	-	1.13
Total		50	24	48.0	319	87.01	448	348.66	1.12
Females	2	1	0	0.0	182	-	77	-	1.28
	3	5	0	0.0	211	27.22	98	51.17	0.97
	4	21	0	0.0	235	27.92	145	57.61	1.06
	5	6	0	0.0	242	77.26	204	199.95	1.09
	6	7	1	14.3	334	79.89	505	349.16	1.15
	8	5	1	20.0	363	10.55	608	64.19	1.27
	10	2	2	100.0	433	32.53	1030	240.42	1.26
	11	4	1	25.0	431	42.54	975	312.89	1.18
	12	16	8	50.0	426	46.08	948	320.63	1.18
	13	7	7	100.0	480	22.31	1363	176.42	1.23
	14	11	10	90.9	475	33.06	1295	291.56	1.19
	15	3	3	100.0	427	27.59	883	205.99	1.12
	16	2	2	100.0	489	35.36	1470	353.55	1.24
	17	7	7	100.0	527	22.71	1744	317.90	1.18
	18	2	2	100.0	570	16.97	2265	77.78	1.22
	20	2	2	100.0	555	1.41	2105	374.77	1.23
	21	2	2	100.0	587	24.04	2400	565.69	1.18
	24	2	2	100.0	598	42.43	2670	56.57	1.26
	25	1	1	100.0	564	-	2120	-	1.18
Total		106	51	48.1	386	125.29	897	712.93	1.15
Both	2	1	0	0.0	182	-	77	-	1.28
	3	5	0	0.0	211	27.22	98	51.17	0.97
	4	39	2	5.1	234	25.00	144	53.32	1.06
	5	11	1	9.1	246	58.73	193	152.29	1.08
	6	12	3	25.0	327	60.43	452	267.43	1.17
	7	2	1	50.0	352	11.31	500	28.28	1.15
	8	9	4	44.4	360	18.30	569	94.40	1.21
	10	4	4	100.0	405	46.09	848	275.36	1.24
	11	5	2	40.0	437	39.36	884	338.87	1.05
	12	16	8	50.0	426	46.08	948	320.63	1.18
	13	13	13	100.0	448	40.93	1122	304.53	1.22
	14	15	13	86.7	457	41.24	1171	331.19	1.20
	15	3	3	100.0	427	27.59	883	205.99	1.12
	16	3	3	100.0	483	27.30	1387	288.68	1.22
	17	7	7	100.0	527	22.71	1744	317.90	1.18
	18	2	2	100.0	570	16.97	2265	77.78	1.22
	19	1	1	100.0	510	-	1460	-	1.10
	20	3	3	100.0	521	58.32	1757	658.96	1.20
	21	2	2	100.0	587	24.04	2400	565.69	1.18
	24	2	2	100.0	598	42.43	2670	56.57	1.26
	25	1	1	100.0	564	-	2120	-	1.18
Total		156	75	48.1	364	118.37	753	653.52	1.14

+ = standard deviation
Number of fish with unknown age that were excluded = 0
Number of fish with unknown sex that were excluded = 0
Number of fish with unknown mat that were excluded = 0

Table 24. Age-specific size and maturity conditions for sauger from Split Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)		Wt ± s.d. (g)		Mean Condition Factor
Males	3	3	0	0.0	189	23.18	62	24.58	0.88
	4	24	0	0.0	218	15.71	103	23.64	0.98
	5	5	0	0.0	233	28.59	128	33.00	1.02
	6	20	0	0.0	244	16.01	142	33.13	0.96
	8	4	0	0.0	266	7.66	185	59.16	0.97
	9	1	1	100.0	286	-	240	-	1.03
	11	2	0	0.0	272	8.49	200	28.28	0.99
	13	2	0	0.0	328	14.14	345	120.21	0.96
	16	1	0	0.0	368	-	430	-	0.86
Total		62	1	1.6	238	34.73	139	71.36	0.97
Females	3	4	0	0.0	175	11.60	51	4.35	0.97
	4	23	0	0.0	217	14.69	100	22.01	0.97
	5	11	0	0.0	245	19.60	140	40.50	0.92
	6	34	3	8.8	251	18.59	146	35.74	0.91
	7	1	0	0.0	260	-	180	-	1.02
	8	3	0	0.0	264	8.00	170	34.64	0.92
	10	5	2	40.0	301	28.66	274	65.80	0.99
	11	3	1	33.3	339	58.73	430	270.74	1.01
	12	3	0	0.0	321	20.28	326	51.28	0.99
	13	4	1	25.0	329	27.40	363	106.58	1.00
	14	2	1	50.0	318	2.83	390	14.14	1.21
	15	2	1	50.0	322	25.46	330	42.43	0.99
	16	1	1	100.0	312	-	260	-	0.86
	17	2	2	100.0	345	18.38	380	0.00	0.93
	18	2	1	50.0	341	15.56	365	35.36	0.92
	19	1	0	0.0	358	-	450	-	0.98
Total		103	13	12.6	260	47.66	185	116.52	0.95
Both	3	7	0	0.0	181	17.47	56	15.79	0.93
	4	47	0	0.0	218	15.07	101	22.66	0.97
	5	16	0	0.0	242	22.60	136	37.65	0.96
	6	54	3	5.6	249	17.85	144	34.55	0.93
	7	1	0	0.0	260	-	180	-	1.02
	8	7	0	0.0	265	7.20	179	47.06	0.95
	9	1	1	100.0	286	-	240	-	1.03
	10	5	2	40.0	301	28.66	274	65.80	0.99
	11	5	1	20.0	312	55.46	338	229.61	1.00
	12	5	0	0.0	321	20.28	326	51.28	0.99
	13	6	1	16.7	329	22.15	357	98.93	0.99
	14	2	1	50.0	318	2.83	390	14.14	1.21
	15	2	1	50.0	322	25.46	330	42.43	0.99
	16	2	1	50.0	340	39.60	345	120.21	0.86
	17	2	2	100.0	345	18.38	380	0.00	0.93
	18	2	1	50.0	341	15.56	365	35.36	0.92
	19	1	0	0.0	358	-	450	-	0.98
Total		165	14	8.5	252	44.37	168	104.11	0.96

± = standard deviation
Number of fish with unknown age that were excluded = 0
Number of fish with unknown sex that were excluded = 0
Number of fish with unknown mat that were excluded = 0

Table 25. Age-specific size and maturity conditions for sauger from Stephens Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)		Wt ± s.d. (g)		Mean Condition Factor
	3	2	0	0.0	205	4.24	77	0.71	0.89
Males	4	21	9	42.9	217	16.93	102	27.74	0.99
	5	7	4	57.1	245	21.07	137	34.98	0.92
	6	14	9	64.3	262	21.04	183	53.27	0.98
	7	2	1	50.0	275	18.38	190	70.71	0.89
	8	7	7	100.0	307	20.34	304	72.08	1.04
	9	4	4	100.0	328	7.83	370	25.82	1.05
	10	14	11	78.6	327	15.13	364	55.98	1.04
	11	4	3	75.0	341	27.92	410	112.84	1.02
	12	7	7	100.0	338	26.64	444	131.13	1.12
	13	3	2	66.7	352	7.21	497	90.74	1.13
	14	2	2	100.0	358	11.31	510	70.71	1.11
	15	1	1	100.0	378	-	640	-	1.18
	16	2	2	100.0	342	14.14	410	42.43	1.02
	17	1	0	0.0	350	-	450	-	1.05
Total		91	62	68.1	283	54.68	263	154.74	1.01
Females	3	2	0	0.0	215	41.01	101	55.86	0.96
	4	13	0	0.0	219	19.16	107	24.93	1.00
	5	6	1	16.7	248	23.93	158	48.01	1.00
	6	18	0	0.0	257	19.00	172	49.62	0.98
	7	2	0	0.0	306	5.66	300	56.57	1.04
	8	8	3	37.5	307	32.16	305	94.57	1.02
	9	5	5	100.0	318	27.89	370	80.62	1.14
	10	4	3	75.0	328	11.89	368	22.17	1.04
	11	9	9	100.0	353	28.43	452	110.65	1.01
	12	12	11	91.7	357	22.74	467	121.01	1.00
	13	3	3	100.0	376	33.05	480	105.83	0.90
	14	1	1	100.0	386	-	540	-	0.94
	16	2	2	100.0	349	7.07	440	56.57	1.03
	17	4	4	100.0	364	23.17	493	61.85	1.03
	18	1	1	100.0	362	-	400	-	0.84
Total		90	43	47.8	298	58.84	299	163.23	1.01
Both	3	4	0	0.0	210	24.49	89	35.10	0.92
	4	34	9	26.5	218	17.58	104	26.42	0.99
	5	13	5	38.5	246	21.51	147	41.06	0.95
	6	32	9	28.1	260	19.74	177	50.71	0.98
	7	4	1	25.0	291	21.06	245	82.26	0.97
	8	15	10	66.7	307	26.35	305	81.84	1.03
	9	9	9	100.0	322	20.97	370	59.16	1.10
	10	18	14	77.8	327	14.14	365	49.85	1.04
	11	13	12	92.3	349	27.71	439	108.43	1.01
	12	19	18	94.7	350	25.29	458	121.67	1.05
	13	6	5	83.3	364	25.11	488	88.64	1.01
	14	3	3	100.0	367	18.04	520	52.92	1.05
	15	1	1	100.0	378	-	640	-	1.18
	16	4	4	100.0	346	9.98	425	44.35	1.03
	17	5	4	80.0	361	20.96	484	56.83	1.03
	18	1	1	100.0	362	-	400	-	0.84
Total		181	105	58.0	291	57.12	281	159.58	1.01

± = standard deviation
Number of fish with unknown age that were excluded = 1
Number of fish with unknown sex that were excluded = 0
Number of fish with unknown mat that were excluded = 0

Table 26. Age-specific size and maturity conditions for northern pike from Split Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)		Wt ± s.d. (g)		Mean Condition Factor
Males	2	1	0	0.0	308	-	190	-	0.65
	3	2	0	0.0	351	24.04	295	35.36	0.68
	4	2	2	100.0	454	14.14	630	56.57	0.67
	5	3	1	33.3	475	22.12	767	254.82	0.70
	6	4	3	75.0	527	17.09	1050	155.13	0.71
	7	2	1	50.0	553	55.15	1065	304.06	0.62
	8	2	1	50.0	676	22.63	1990	579.83	0.66
	9	1	1	100.0	698	-	3140	-	0.92
Total		17	9	52.9	506	112.50	1046	760.10	0.69
Females	3	2	0	0.0	388	53.74	400	141.42	0.67
	4	1	0	0.0	412	-	480	-	0.69
	5	7	2	28.6	475	60.33	729	263.47	0.66
	6	6	1	16.7	543	51.05	1143	459.72	0.68
	7	2	0	0.0	592	22.63	1315	360.62	0.63
	8	3	1	33.3	710	42.00	2973	525.48	0.83
	9	1	0	0.0	688	-	2570	-	0.79
	11	1	1	100.0	702	-	1800	-	0.52
Total		23	5	21.7	542	111.71	1268	882.68	0.69
Both	2	1	0	0.0	308	-	190	-	0.65
	3	4	0	0.0	370	40.15	348	103.72	0.68
	4	3	2	66.7	440	26.23	580	95.39	0.68
	5	10	3	30.0	475	50.35	740	247.07	0.67
	6	10	4	40.0	537	40.17	1106	357.44	0.70
	7	4	1	25.0	573	41.13	1190	308.22	0.62
	8	5	2	40.0	696	36.83	2580	715.68	0.76
	9	2	1	50.0	693	7.07	2855	403.05	0.86
	11	1	1	100.0	702	-	1800	-	0.52
Total		40	14	35.0	527	112.05	1174	829.94	0.69

± = standard deviation
Number of fish with unknown age that were excluded = 0
Number of fish with unknown sex that were excluded = 0
Number of fish with unknown mat that were excluded = 0

Table 27. Age-specific size and maturity conditions for northern pike from Stephens Lake, 1987.

Sex	Age (Years)	Number	Maturity: Number Mature	Maturity: % Mature	Fl ± s.d. (mm)		Wt ± s.d. (g)		Mean Condition Factor
Males	1	1	0	0.0	210	-	55	-	0.59
	2	3	2	66.7	315	22.03	207	40.41	0.66
	3	3	1	33.3	335	60.18	263	160.10	0.63
	4	7	7	100.0	453	30.57	636	56.53	0.69
	5	2	2	100.0	447	35.36	585	219.20	0.64
	6	2	2	100.0	600	141.42	1690	1230.37	0.70
	7	5	5	100.0	592	47.08	1398	259.65	0.67
	8	1	1	100.0	574	-	1120	-	0.59
	10	2	2	100.0	658	53.74	2055	714.18	0.70
Total		26	22	84.6	472	131.80	873	682.93	0.67
Females	2	5	0	0.0	316	25.20	238	56.75	0.75
	3	6	0	0.0	343	27.53	290	82.95	0.70
	4	6	0	0.0	450	25.67	617	123.56	0.67
	5	4	0	0.0	470	23.83	675	103.44	0.65
	6	8	3	37.5	567	81.16	1249	510.00	0.65
	7	5	3	60.0	606	164.71	1764	1598.16	0.67
	8	4	4	100.0	711	93.19	2920	1130.07	0.78
	10	2	2	100.0	928	186.68	6060	3167.84	0.73
	11	1	1	100.0	930	-	6320	-	0.79
Total		41	13	31.7	522	184.71	1421	1758.51	0.69
Both	1	1	0	0.0	210	-	55	-	0.59
	2	8	2	25.0	316	22.39	226	50.69	0.71
	3	9	1	11.1	340	37.35	281	104.34	0.68
	4	13	7	53.8	452	27.29	627	89.76	0.68
	5	6	2	33.3	462	27.05	645	134.87	0.64
	6	10	5	50.0	574	86.81	1337	636.48	0.66
	7	10	8	80.0	599	114.43	1581	1096.51	0.67
	8	5	5	100.0	683	101.19	2560	1267.20	0.74
	10	4	4	100.0	793	192.04	4058	2976.87	0.72
	11	1	1	100.0	930	-	6320	-	0.79
Total		67	35	52.2	503	166.91	1208	1457.17	0.68

+ = standard deviation
Number of fish with unknown age that were excluded = 0
Number of fish with unknown sex that were excluded = 1
Number of fish with unknown mat that were excluded = 1

Table 28. Length-weight curves for fish captured in Split and Stephens lakes, 1987.

Species	Lake	Log_e W = a+b * Log_e L	r
Whitefish	Split	$\log_e Y = -12.403 + 3.236 \log_e X$	0.993
	Stephens	$\log_e Y = -12.668 + 3.273 \log_e X$	0.973
Walleye	Split	$\log_e Y = -12.305 + 3.155 \log_e X$	0.991
	Stephens	$\log_e Y = -12.422 + 3.177 \log_e X$	0.994
Sauger	Split	$\log_e Y = -11.610 + 3.008 \log_e X$	0.970
	Stephens	$\log_e Y = -12.305 + 3.141 \log_e X$	0.989
Northern pike	Split	$\log_e Y = -12.669 + 3.124 \log_e X$	0.978
	Stephens	$\log_e Y = -12.286 + 3.063 \log_e X$	0.994
Cisco	Split	$\log_e Y = -12.231 + 3.212 \log_e X$	0.993
	Stephens	$\log_e Y = -13.232 + 3.377 \log_e X$	0.983
White sucker	Split	$\log_e Y = -12.075 + 3.178 \log_e X$	0.984
	Stephens	$\log_e Y = -11.664 + 3.111 \log_e X$	0.987
Longnose sucker	Split	$\log_e Y = -11.494 + 3.060 \log_e X$	0.994
	Stephens	$\log_e Y = -10.264 + 2.854 \log_e X$	0.998
Shorthead redhorse	Split	$\log_e Y = -11.505 + 3.008 \log_e X$	0.976
	Stephens	only 1 fish	
Mooneye	Split	$\log_e Y = -12.032 + 3.164 \log_e X$	0.993
	Stephens	$\log_e Y = -13.607 + 3.444 \log_e X$	0.992
Burbot	Split	$\log_e Y = -10.557 + 2.765 \log_e X$	0.992
	Stephens	$\log_e Y = -10.197 + 2.731 \log_e X$	0.971
Yellow perch	Split	$\log_e Y = -13.579 + 3.501 \log_e X$	0.971
	Stephens	$\log_e Y = -11.255 + 2.993 \log_e X$	0.777
Lake chub	Stephens	$\log_e Y = -11.336 + 3.008 \log_e X$	0.955

Table 29. Maturity rate equations for whitefish, walleye, sauger and northern pike from Split and Stephens lakes, 1987.

Species	Lake	Sex	Regression *	r	Age at 50% mature (yrs)
Whitefish	Split	males	Y = 5.756 - 0.931 X	0.904	6.2
	Stephens		Y = 3.160 - 0.495 X	0.772	6.4
	Split	females	Y = 5.356 - 0.723	0.924	7.4
	Stephens		Y = 6.092 - 0.808 X	0.978	7.5
	Split	both	Y = 4.778 - 0.714 X	0.946	6.7
	Stephens		Y = 4.035 - 0.587 X	0.943	6.9
Walleye	Split	males	indeterminant data points		
	Stephens		Y = 5.202 - 0.774	0.993	6.7
	Split	females	indeterminant data points		
	Stephens		indeterminant data points		
	Split	both	Y = 10.262 - 0.723 X	0.877+	14.2
	Stephens		Y = 5.929 - 0.770 X	0.953	7.7
Sauger	Split	males	indeterminant data points		
	Stephens		Y = 0.491 - 0.116 X	0.339+	4.2
	Split	females	indeterminant data points		
	Stephens		indeterminant data points		
	Split	both	Y = 7.392 - 0.482 X	0.775+	15.3
	Stephens		Y = 2.246 - 0.280 X	0.593+	8.0
Northern pike	Split	males	Y = 0.539 - 0.099 X	0.172+	5.4
	Stephens		indeterminant data points		
	Split	females	indeterminant data points		
	Stephens		indeterminant data points		
	Split	both	Y = - 0.184 + 0.081 X	0.238+	2.3
	Stephens		Y = 2.680 - 0.509 X	0.802+	5.3

* $Y = \log_e \left(\frac{100 - Yi}{Yi}\right)$ where Yi = frequency of mature fish in age class i,
X = age (yrs)
+ = non significant at $P \geq 0.05$

Table 30. Maturity rate equations for whitefish, walleye, sauger and northern pike from Split and Stephens lakes, 1987.

Species	Lake	Instantaneous mortality (Z)	Annual mortality (A)	Annual survival (S)	r	Age classes
Whitefish	Split	0.874	0.583	0.417	0.998	9–13
	Stephens	0.670	0.488	0.512	0.950	10–13
Walleye	Split	1.330	0.736	0.264	0.971+	14–16
	Stephens	1.000	0.632	0.368	0.993	17–19
Sauger	Split	0.600	0.451	0.549	0.918+	6,8,10
	Stephens	0.967	0.620	0.380	0.996	12–15
Northern pike	Split	0.507	0.398	0.602	0.966+	8,9,11
	Stephens	0.496	0.391	0.609	0.876+	7,10,11

+ = non significant at $P \geq 0.05$

Table 31. Walford curves for whitefish, walleye, sauger, and northern pike from Split and Stephens lakes, 1987.

Species	Lake	Walford curve $L_{t+1} = a+b * L_t$	L_∞ (mm)	Age classes used	r	Mean square error
Whitefish	Split	Y = 81.708 + 0.847 X	534	1-13	0.980	326.871
	Stephens	Y = 45.499 + 0.930 X	649	6-13	0.937	155.892
Walleye	Split	Y = 75.762 + 0.851 X	508	3-15	0.978	188.755
	Stephens	Y = 56.903 + 0.903 X	586	2-14	0.970	527.226
Sauger	Split	Y = 57.767 + 0.837 X	354	3-13	0.983	53.250
	Stephens	Y = 38.869 + 0.917 X	468	3-15	0.987	76.670
Northern pike	Split	Y = 114.338 + 0.873 X	900	2-11	0.961	1444.669
	Stephens	Y = 105.183 + 0.911 X	1181	1-8	0.946	2353.422

+ = non significant at $P \geq 0.05$

Table 32. Relationship of Log_e $(L_\infty - l_t)$ and t (yrs) for whitefish, walleye, sauger, and northern pike from Split and Stephens lakes, 1987.

Species	Lake	Log_e $(L_\infty - l_t)$ = a-b * t	Age classes used	r	Mean square error
Whitefish	Split	$\log_e (534-l_t) = 6.075 - 0.154\ t$	1–13	0.977	0.019
	Stephens	$\log_e (649-l_t) = 6.105 - 0.066\ t$	6–13	0.982	0.001
Walleye	Split	$\log_e (508-l_t) = 6.085 - 0.121\ t$	3–15	0.967	0.019
	Stephens	$\log_e (586-l_t) = 6.224 - 0.101\ t$	2–14	0.989	0.004
Sauger	Split	$\log_e (354-l_t) = 5.735 - 0.182\ t$	3–13	0.984	0.013
	Stephens	$\log_e (468-l_t) = 5.841 - 0.091\ t$	3–15	0.995	0.001
Northern pike	Split	$\log_e (900-l_t) = 6.684 - 0.140\ t$	2–11	0.963	0.015
	Stephens	$\log_e (1181-l_t) = 6.976 - 0.091\ t$	1–8	0.988	0.001

+ = non significant at $P \geq 0.05$

Table 33. Power curves for whitefish, walleye, sauger and northern pike from Split and Stephens lakes, 1987.

Species	Lake	Power curve $Y = a * X \uparrow b$	Age classes used	r	Mean square error
Whitefish	Split	$Y = 158.464 * X \uparrow 0.438$	1-15	0.983	0.005
	Stephens	$Y = 167.835 * X \uparrow 0.389$	3-19	0.960	0.004
Walleye	Split	$Y = 138.086 * X \uparrow 0.420$	3-21	0.979	0.003
	Stephens	$Y = 126.552 * X \uparrow 0.488$	2-25	0.985	0.004
Sauger	Split	$Y = 135.245 * X \uparrow 0.334$	3-19	0.985	0.001
	Stephens	$Y = 144.528 * X \uparrow 0.334$	3-18	0.969	0.002
Northern pike	Split	$Y = 210.651 * X \uparrow 0.528$	2-11	0.988	0.002
	Stephens	$Y = 197.516 * X \uparrow 0.595$	1-11	0.987	0.006

+ = non significant at $P \geq 0.05$

APPENDIX 1

A 22.9 cm stretched measure gill net was set twice below Gull Rapids in an attempt to capture sturgeon. The first set (S1) caught nothing, however, the second set (S2) yielded 1 sturgeon.

Fork length 320 mm

Dressed length 80 mm

No weight available as the fish exceeded the 15 kg. capacity of the scale. It was tagged with floy tag #S00456 and released. No ageing structure (fin ray) was taken.